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PROCEDURES IN NURSING

ANNABELLA McCRAE

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PROCEDURES IN NURSING

PRELIMINARY AND ADVANCED

BY

ANNABELLA McCRAE

Instructor in Practical Nursing

AT THE

MASSACHUSETTS GENERAL HOSPITAL
TRAINING SCHOOL FOR NURSES
BOSTON

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PREFACE

In preparing this book the first aim of the writer was to do away with separate outlines, and to substitute for them the more convenient book form.

The order of lessons that has been followed is the order that has been found to be best suited to the needs of the Training School of this hospital.

The more common treatments of eye, ear, nose, and throat are outlined, which may prove helpful to those who have had experience in these lines, and to those who at any time may meet such conditions in general nursing practice. For the use of this material indebtedness is acknowledged to Dr. Harris P. Mosher, chief of service in the Laryngological Department of the Massachusetts Eye and Ear Infirmary, and to Miss Helen O. Potter, Assistant Superintendent of Nurses of its Training School, and her assistants; and also for opportunity for observation in the wards and operating room.

For helpful suggestions, valuable aid and kind coöperation, my appreciation is here expressed to Dr. George A. Leland, Jr., who has read the proof of many chapters; to the house officers, head nurses, my assistants, and Mr. Joseph Godsoe, the hospital pharmacist. My thanks are due also to the student nurses who have made contributions by camera and pencil.

A. McC.

PART I

Preliminary Procedures

I

DAILY ROUTINE OF HOSPITAL HOUSEKEEPING

SWEEPING AND DUSTING

Purpose

To promote the welfare of the hospital household through sanitation and order.

Dust

Outside dust is composed of dry particles of organic waste from human and animal bodies, and of clay, sand, and soot. It is carried into the house on the feet and clothing. It is stirred up by street traffic and blown through open doors, windows, and crevices.

Inside dust is composed of particles of textile materials, such as sheets, blankets, and dressings. Added to that are bacteria from dry discharges of wounds, which find their way through the dressings; worn out epitheleal cells; and other effete matter from the human body.

Sweeping a polished floor

Equipment

long-handled floor brush
long-handled broom
short-handled dust brush
dustpan
pail with damp sawdust

Disposal of dustpan and brush

The dustpan should be placed flat on the floor at one side, where it will not be stepped on. Never place it on tables or chairs.

The short-handled dust brush should be placed on its back on dustpan at all times, never on the bristle side.

Method

A handful of sawdust is sprinkled under each bed. This is where the greatest collection of dust is found.

In sweeping, use short strokes without elevating the brush, in order to prevent scattering. In sweeping under a bed, draw the brush toward you. On the open floor, push forward with the grain of the boards.

Take up sweepings in dustpan at each corner of open ward, and outside of each room door in a closed ward, so that the dust may not be carried through the corridors.

Scraps of gauze, toilet paper, and hair combings should not be swept about, but should be gathered up at once and put in the proper receptacle.

Adherent pads of dust should be removed from feet of chairs, tables, and screens.

Furniture should be replaced in order as you go along.

Note

The above describes the routine proceedings in the morning care of the ward. The floors are gone over again in the middle of the day with a dry twine mop, to pick up particles of fluff.

After care of utensils

The brush should be cleaned off into dust pail with hand brush and adherent fluff picked off with the fingers.

Suspend broom in rack with handle down.

The dustpan is swept off into dust pail and hung up by handle. It should be washed in hot suds once a week.

The hand brush is picked clean of dust and lint and suspended by its handle.

Notes

Straight pins and safety pins should be picked up, sterilized, left to dry in a towel and used again.

No attempt should be made to sweep up water, as it ruins the brush and smears the polished floor. Water should be wiped carefully from the floor by using dry picked cotton, before the sweeping is begun.

Use turpentine or a little floor polish to remove stains.

Damp dusting

This method of dusting is employed in the care of hospital furnishings which are not upholstered, and for the removal of dust from all surfaces above the floor.

Equipment

Agate pail half-full of warm, soapy water.

Piece of rubber sheeting or newspaper to place under dust pail.

Cheese cloth duster a yard square, with a tape loop sewn on the corner.

Cake of fine sand soap or a shaker of soap powder.

Method

A ward should be dusted as soon as dust has settled, following a morning sweeping.

The duster should be wrung from the soapy water as dry as possible, rinsed in it frequently during the process, and the water changed when cloudy.

In the routine of dusting, start with the surfaces at the highest level and work down.

In dusting of bedsteads the card rack and chart holder should be removed and not pushed back and forth on the rung of bed.

In dusting the bedside table remove all articles if thorough methods are to be carried out.

The molding and base board should be dusted with care, to avoid leaving a soiled streak on the painted wall.

A little soap powder or fine sand soap should be used about the edges and knobs of doors to remove finger marks from painted and enameled surfaces.

Included in the dusting are the window sashes and sills.

After care of duster

The duster should be washed in suds and hung to dry.

Note

The high dusting is done weekly with a long-handled hair brush kept for all surfaces which cannot ordinarily be reached by the hand.

Care of special furniture

In a hospital ward whenever possible the furnishings are of materials which may be washed and disinfected.

Furniture polish or turpentine should be used on varnished surfaces weekly, or when necessary, after they have been cleaned with the duster wrung out of tepid water.

Electric fixtures should be dusted with a dry duster.

DAILY CARE OF ICE TANK FOR DRINKING WATER

This is attended to early every morning, by emptying out the water and washing the tank with slightly soapy water.

Use a little soap powder once a week to remove any deposit which may have formed on the lining. Follow with a thorough rinsing of scalding hot water and dry thoroughly. Allow to cool before putting in ice.

Wash the outside of the ice tank and cover.

Wash and scald the drip pan daily.

The ice tank should be filled with ice and then with fresh water and replenished as often as necessary during the day.

DAILY CARE OF THE REFRIGERATOR

In order to be ready for the reception of ice and fresh food, this also is attended to early in the morning.

The drip pan is emptied and scrubbed with a brush and hot suds to prevent the formation of a slimy deposit.

In one's own home a less frequent cleaning might prove sufficient, but in a hospital, where refrigerators are in close contact with the ward dust, it is essential that this should be attended to daily.

It is a duty which should not be left in the hands of an ignorant maid, as the proper care of food and refrigerator plays an important part in household sanitation.

Cleaning the refrigerator

A special cloth is provided for this purpose. It is best made of coarse huckabuck, 12″ by 16″, with a tape loop to suspend it at the side of the refrigerator.

All utensils and food should be removed and the shelves taken out and washed in a pan of hot suds, rinsed, dried thoroughly and aired until ready to be returned to their places.

The food chamber is washed, top, sides, and bottom, and dried. A little fine sand soap may be used occasionally on the bottom, if there are any stains that ordinary cleansing will not remove.

The left-over ice is removed, washed, and used for drinking water in the ice tank.

The corrugated zinc shelf, on which the ice rests, is removed and washed in suds, rinsed, dried, and placed at one side, preferably at an open window, to air.

The top, sides, and bottom of the ice chamber are now washed.

Leading from the ice chamber is the drip pipe, which carries off the water from the melting ice. This is scalded with a pitcher of hot water and cleaned with a long wire-handled bristle brush, which reaches down to the trap. The floor of the ice chamber may be dashed with cold water, in order to cool it before the ice is replenished.

The ice chamber is dried, being especially careful of the corners where slime is apt to collect. A wooden skewer is used for this purpose.

The inside of the refrigerator doors and surrounding wooden framework are washed. The wooden skewer is used in cleaning the crevices.

The shelves are put back in the food chambers.

The varnished outside of the refrigerator is cleaned with tepid water and dried. Soap and water may be used about the nickel door handles.

Finally, the cup-like appendage hanging below the drip pipe under the refrigerator is washed and dried, as it is likely to become slimy if neglected.

Care of the food

Left-over food, such as broths, milk, and custards of the previous day, if in good condition, should be used before touching the day's fresh supply.

The left-over butter should be removed from its jar and put in a bowl, the jar washed and made ready for the fresh daily supply.

The outside of each utensil should be wiped before replacing.

Notes

Fruit should not be kept in the refrigerator, as it flavors the milk or butter.

Warm food should never be placed in a refrigerator, as the cold air comes in contact with the food and is warmed, thus raising the temperature of the refrigerator.

Refrigerator doors should be kept closed at all times to prevent waste of ice and cold air, upon which the preservation of food depends.

The butter jar should be kept covered.

Do not allow food of any kind to accumulate.

After care of equipment

The refrigerator towel is washed in hot suds, rinsed in cool water, and hung up to dry. The dishpan is washed, dried, and put away, and the floor about the refrigerator mopped up, if necessary.

II

A HOSPITAL BED AND BEDMAKING

Construction

Bedstead

Usually enameled iron.

Springs

Linked or woven wire, fine or coarse.

Surgical springs, *i.e.*, flat steel slats interlaced.

The bedstead may be mounted on heavy casters in order that it may be moved out of doors, or on flanges of glass, iron or wood to keep the bed steady.

Dimensions

Height

26 inches to 30 inches to top of mattress.

Width

30 inches to 36 inches.

Length

Usually 6½ feet, but on a male ward 6¾ feet is more desirable.

Furnishings and equipment

2 mattresses, one husk and one hair
2 pillows, with cases
3 cotton sheets, upper, lower and draw
1 rubber draw sheet

2 or more woolen blankets, according to need of the patient
1 spread
1 patient's towel
1 wash cloth

Mattress

If a woven or linked wire spring is used, one hair mattress of ordinary weight, usually thirty pounds, is sufficient.

If a spring of interlaced steel slats, two mattresses are necessary (one husk and one hair) to make up for the lack of buoyancy.

Pillows

May be large or small, of feathers, hair or down. Usual size for large pillow is, length, 31 inches; width, 17 inches.

Before starting, have everything needed at bedside; one towel, one sheet, and one pillow case used daily for each bed, laundry bag, and whisk broom or folded towel for brushing the bed.

Preliminary details before starting bed making

Use top sheet of previous day for fresh draw sheet, unless it is soiled. A fresh under sheet is put on once a week unless required oftener; a fresh spread once in four days if needed.

Use careful judgment about changing linen and err on the economical side.

MAKING AN EMPTY BED

Stripping bed

Making first side

Making second side

Pillows

General adjustment of bedside or room

Stripping bed

Pillows

Turn bedside chair to face head of bed. Note cases and remove the one most soiled, by firmly grasping end of pillow with left hand and stripping case from pillow with right. Place pillows on arms of chair, the soiled case in laundry bag.

Bedclothing

Loosen bedclothing by slightly lifting edge of mattress with one hand and slip out clothing with other.

Fold spread and place on head of bed.

Remove each blanket separately and drape around chair in shawl-like fashion, clear from floor; likewise the sheets, if not soiled.

If soiled, the draw sheet is gathered up, keeping the dust inside, and placed in bag.

Remove rubber draw sheet and under sheet and place on chair. Permit bed to air.

Mattresses

Brush off mattresses around buttons and bindings, sweeping from center toward the edge.

Turn hair mattress from head to foot to shift the wear and position, the greatest pressure being nearer the head of the bed. If mattress becomes flattened on one side more than the other it is permissible to turn it from side to side occasionally.

See that the mattresses are even before starting to make the bed.

Note: The first day the patient sits up out of bed after an illness, it is customary to turn both mattresses.

Making first side of bed

Application of under sheet

Place sheet on bed with folded crease in middle.

Carry over at top and extend 6 inches under both mattresses.

Square corner and tuck sheet along side under both mattresses.

At foot pull tightly and tuck under one mattress.

Square corner and complete tucking in at side.

Application of rubber draw sheet

See that rubber sheet is whole.

Place it on the bed so that it extends well under the pillow. Allow 2 inches for extra tension on the opposite side when that shall be drawn tight.

Tuck snugly under both mattresses.

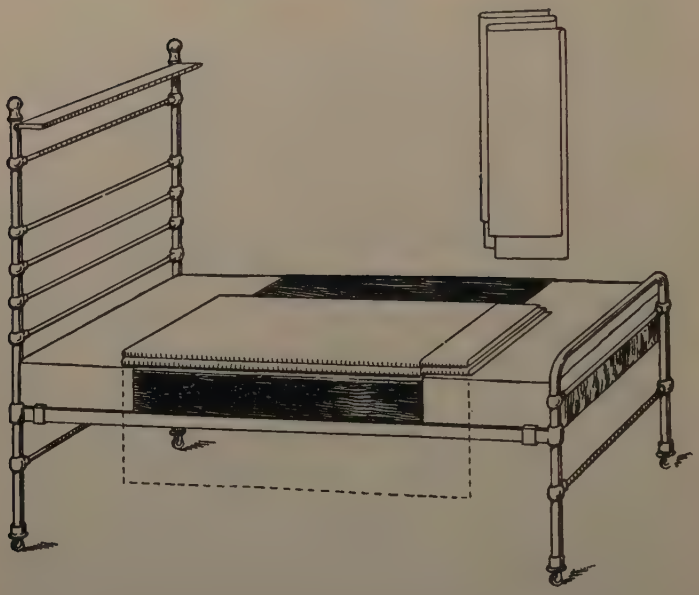
Folding and application of cotton draw sheet

Fold ordinary-sized sheet end to end, sliding one hem 8 inches below the other in order to cover rubber sheet fully when in position.

Holding the long side of draw sheet towards you, fold evenly in fourths in fan-like fashion, with selvage edges toward the center, ready to be placed in position on bed.

Place on side of bed with selvage edges towards middle of bed and 2 inches above top of rubber sheet.

Turn down the upper fold and tuck securely under mattresses.



HOSPITAL BED SHOWING FOLDED DRAW SHEET

Application of upper sheet

Place evenly on bed, hem wrong side up, the edge 6 inches from head of mattress after turning a 12-inch fold under itself, temporarily out of the way.

Tuck bottom of sheet under both mattresses half way across the foot of bed.

Square corner and tuck in at side less than half way up towards head.

Application of blankets

Apply even with fold of upper sheet, *i.e.*, 6 inches from head of mattress, which gives the patient sufficient covering for his shoulders, when lying on his side.

If blankets are short, the last blanket should be put on the bed about 8 inches or 10 inches lower than the others, in order to cover patient's feet and to hold bedclothing in position. The blankets are tucked under both mattresses at the same time, half way across foot of bed and finished with a flat square corner at side.

Making second side of bed

Preparation

Step to opposite side of bed.

Pick up hanging rubber sheet at side of bed and bed clothes with it. Fold back neatly, exposing half of bed and under sheet.

Arrangement of under sheet

Lift up both mattresses at head and tuck in remainder of sheet.

At foot of bed, grasp sheet with both hands, pull firmly and tuck under top mattress.

Step to side of bed, grasp sheet firmly in the center, with palms of hand downward, right knee braced against bed to steady it, and pull with an upward swing of the hands. This serves as a check and prevents the sheet from being pulled out on the opposite side.

Tuck under both mattresses while the sheet is at extreme tension.

Square corners, head and foot.

Adjustment of rubber sheet

Grasp edge of rubber sheet in middle. Pull tightly and carry to full extent under both mattresses. The same

procedure is carried out the whole length of the sheet, which helps to bind it firmly around the mattresses.

Adjustment of cotton draw sheet

The same measures are employed in this case as with the rubber sheet, being careful that the under side is perfectly smooth before tucking in.

Adjustment of upper sheet

Adjust and tuck under both mattresses at foot.

Square corners and tuck a little less than half way up the side.

Blankets

Tuck in at foot of bed.

Square corners and carry under both mattresses at side, as far as sheet.

Application of spread

Place on bed with the prominence of the ironed crease in the middle.

Tuck under both mattresses at foot.

Turn corners in an angle, leaving sides of spread hanging in a slant.

Pull edge of spread tight at head of bed and fold over edge of blankets. Bring the hem of upper sheet out over spread, *i.e.*, the 12-inch fold.

Pillows

Adjustment of first pillow. (Case not changed.)

Grasp the long-seam side and settle the pillow towards the opposite side of case.

Place pillow on table and smooth firmly from end to end.

Reverse pillow and repeat process.

Grasp seam side of case with both hands and place carefully on bed with open end parallel with card rack on left side of bed, and finish by smoothing from center to the sides.

Adjustment of second pillow. (Case changed.)

A fresh case is put on by holding pillow between left elbow and side while both hands are employed in opening the clean case, in which the end of pillow is inserted and the pillow shaken down into the corners.

As the case is usually larger than the pillow, grasp the long-seam side of case and settle pillow toward the seamless side, when it is treated in the same manner as the first pillow and put in position over first pillow, with open end toward the chart or right side of bed.

Note: It is not usually necessary to change more than one pillow case daily and that only if soiled or damp with perspiration.

Attention to general details

The patient's towel

The towel hangs with folded edge against side of bedstead, with wash cloth, on rung even with upper pillow.

See that card rack and chart are in position.

Bedside table should be parallel with head of bed, drawer forward.

Inspect drawer for concealed food, drugs, etc., as it is solely for small and necessary effects of patient; *i.e.,* tooth brush, comb, and other toilet articles.

Replace table cover evenly.

If there are flowers, change water and rearrange.

Remove old newspapers.

Place chair beside foot of bed.

Scrutinize your work and do not leave until everything is in order.

Notes

Time necessary

If uninterrupted, one should not need more than five to eight minutes to make an empty bed.

Repairs

Hollowed hair mattresses and perforated rubber sheets should be exchanged. Mattresses should have tufts replaced at once, otherwise they soon become lumpy. Rips in pillow tickings call for immediate repair.

Stains

Blood-stained pillows and mattresses are inexcusable in a well-equipped hospital ward where rubber pillow cases are provided and rubber sheets kept in good repair.

The same may be said of unsightly stains on bed linen due to the use of silver solutions, gummy tinctures, ointments, and disinfectants.

Rules regarding patients

Patients should not be permitted to keep any of their belongings under the pillows or mattresses.

If a convalescent patient wishes to rest on his bed during the day the spread may be protected by a gray blanket. As soon as the patient arises, the blanket should be removed and the bed smoothed and pillows rearranged. In most cases it is best to have the patient undress and get into bed for the rest period.

Method of handling bed linen.

In transportation of clean linen from one bedside to another it should not come in contact with any bedding other than that of the bed for which it is intended.

The soiled linen, on removal from bed, should be put into laundry bag at once.

Enough cannot be said against throwing soiled bed linen on the floor during bed making.

It means danger of scattering bed dust and germs.

It means handling the linen twice.

It denotes slovenly and disorderly methods.

Red and white bags are used for soiled laundry from all special precaution cases. A precaution tag is attached, on which are written the ward number and the nature of the disease. These bags are also used for linen which may be stained from discharging wounds, or blood, and from beds of incontinent patients.

III

MAKING AN OCCUPIED BED

Equipment

2 sheets
1 pillow case
1 towel
1 spread (if needed)
1 nightgown
laundry bag
bottle bathing solution
talcum powder
whisk broom
the last three carried in an agate basin

Procedure

Remove table cover. Arrange linen on table in order wanted, basin on shelf under table. Place laundry bag under bed.

Change only such sheets as necessary.

As a general rule the nurse begins on the patient's right.

Making upper part

Loosen upper clothing.

Remove spread and place on bed-shelf.

Remove all pillows but one and place on chair. At this time remove soiled case if necessary.

Remove all blankets but one and drape over back of chair.

Turn remaining blanket and sheet back over the feet even with foot of bed and fold back also at the patient's waist to facilitate removal.

Place clean sheet over blanket; turn hem under in usual way.

Take blanket from chair and place over clean sheet, both turned even with foot of bed.

Removal of soiled upper bedclothing

If the patient's strength permits, he may hold upper edges of clean blanket and sheet, otherwise tuck over shoulders before removing soiled linen.

Stand at foot of bed with left side toward foot. Raise clean sheet and blanket with left hand. With right hand remove soiled sheet and blanket with a quick motion, catching them over right arm to prevent dragging on the floor. Spread blanket over the chair, and if sheet is unsoiled, fold into draw sheet; otherwise put in laundry bag. Turn patient on left side by putting both hands under the sacrum and, drawing patient toward you, slowly turn on side. Position of patient should be hips drawn back and upper shoulder and knee forward for balance. Fold back upper bedclothing over patient, lengthwise, preparatory to

Care of the back

Patient's own towel is used in each case. Unbutton nightgown. Draw towel through left hand by a corner, folding it back and forth. Holding bottle of bathing solution in right hand, remove cork with little finger of left. Wet folded thicknesses of towel with the solution. Replace cork, and put bottle back in basin. Envelop right hand with towel, bringing wet part over fingers, make a couple of turns around back of hand and wrist. Bathe

back with circular motion over prominent parts as shoulders, sacrum, and coccyx and also under edges of swathe, if one is worn. Elbows and heels may be included. Apply powder with both hands. If nightgown is to be changed it should remain unbuttoned.

Making under part

Loosen each sheet separately, draw sheet first. Gather in small folds, beginning at center of the bed, and press down as close to patient as possible; wedge partially under patient, with fingers held rigidly. Sweep off rubber sheet. Unfasten, turn down a corner at head and fold over patient. Unfasten under sheet and pass it under patient from head to foot. Sweep off mattress.

Place clean sheet on bed, doubled full length, right side up, selvage edge toward patient. Gather upper fold in both hands, starting with selvage edge (at the same time turning under fold out over edge of bed), and press under patient as far as possible; what is left is gathered in small folds close to the patient until the middle of sheet is reached, to be pulled through later when patient is turned over to opposite side of bed.

The remaining half of sheet is tucked in securely under both mattresses at the head, and square corner made. At the foot, the sheet is grasped firmly in both hands, pulled tight and tucked under the upper mattress only. Square corner is made and remainder of sheet tucked under both mattresses at side.

Rubber sheet is now adjusted and its overhanging edge grasped in the middle with both hands, pulled tight and tucked in, then the top and bottom edges.

The folded draw sheet is placed in position over the rubber sheet, the upper selvage fold is brought over the edge of mattress and tucked in, the under selvage edge is pressed under patient as far as possible and what is left is gathered in small folds until the middle of draw sheet is reached, to be pulled through when patient is turned.

When the under sheets are not changed they are brushed free of crumbs and bed dust.

Support patient's head with one hand and with other draw the pillow to completed side of bed. Assist patient to move to completed side and adjust pillow comfortably under head.

Stepping to opposite side of bed, fold back upper bedclothes lengthwise over patient, avoiding exposure. Remove soiled draw sheet, fold in so that no bed dust escapes, and put in bag. Pull through fresh cotton draw sheet and fold over patient in same way as rubber sheet previously.

Sweep off rubber sheet. Loosen and fold over patient. Gather up soiled under sheet and put in bag. Sweep mattress. Pull through and adjust clean under sheet. Tuck in head and foot; pull and tighten middle. Tuck in and make corners. Tighten rubber sheet by grasping firmly and lifting upward while pulling, and tuck in. Adjust draw sheet and tuck in.

Support head and pull pillow to middle bed. Turn patient on back. At this time, if patient has slipped down in bed, lift higher on pillow. Patient may help by flexing knees and pressing soles of feet on bed and grasping rung of bed with both hands.

Changing nightgown

Turn down bedclothes to waist. Pull nightgown out from each side of body carefully. The change from soiled to clean gown is made one arm at a time. Place hand in armhole of sleeve and, grasping patient's elbow, with other hand remove sleeve. Put down arm gently. Clean nightgown is placed over soiled one. Introducing hand into sleeve, grasp patient's hand and draw his arm into sleeve. See that gown fits well over shoulders. Button at neck; with very sick patient it is not essential to button all the way down. Slip out soiled gown and pull down clean gown.

If necessary, wide wrists of gown may be secured with safety pins thrust through horizontally above band, making a frill. Adjust shoulder seams to prevent binding arms.

Arrangement of pillows

The pillow under patient's head is now removed. Collapse pillows from each end to bring feathers to center. Shake feathers down into case, holding pillow by side seam. Grasp in center of side and place under patient for support of shoulders; put clean case on second pillow, shake as first pillow, and place under head.

Final arrangement of upper bedclothing

Make sure that bedclothing is well up under chin and over shoulders. Tuck upper sheet under both mattresses at the foot. In making corners a plait is taken at both sides to prevent pressure over the toes. Put on second blanket; tuck in both, making same plait while turning

corners. Sheet and blankets are tucked on both sides as far as the patient's knees, not above.

Put on spread evenly. Arrange evenly with blankets at top, or if long enough, turn over blankets. Tuck under both mattresses at foot and carry round corner to form a diagonal fold. Top of sheet is turned out over spread. Center of sheet should meet center of spread.

If the patient wishes arms outside of bed covers make an additional fold of the upper bedclothing upon itself as far as arm spaces. Suit the patient's comfort as far as possible.

Bedside adjustment

Put on table cover. Replace table, inspect drawer and replace chair. Take away laundry bag, basin and whisk broom. Leave bedside in order.

IV

CHANGING OR TURNING MATTRESS WITH PATIENT IN BED

WHEN TWO MATTRESSES ARE USED

Purpose

To replace an old mattress with a new one.

To change the position of mattress for the comfort of the patient.

Procedure

In order to move the patient comfortably, two nurses should take part in the operation. Loosen upper and lower bedclothing, remove and fold spread, remove all blankets but one and remove all pillows but one. Have the patient in the middle of the bed. Turn the corners of the bedclothing at the head of the bed over the patient's shoulders; turn up the bedclothing at the foot of the bed over the patient's feet, and fold the lower corners diagonally along the side of the patient's body. The bedclothing which remains hanging at each side of the bed is now carried over the patient snugly from either side.

Moving the patient to the edge of the mattress

The nurse and her assistant stand on the same side of the bed. One encircles the patient's shoulders and back with her arms; the other encircles the patient's pelvis

and thighs, and together they draw the patient towards the edge of the mattress. They now step to the opposite side of the bed and grasp the sides of the mattress where the weight of the patient's body is greatest, and draw the mattress towards them until there is sufficient room on the mattress opposite for the patient's body.

A bedside stand or small table is placed under the overhanging edge of the upper mattress. The nurse and her assistant step back to the first side and together slide the patient on the under mattress, when the top mattress may be exchanged for a new one or be turned from top to bottom for change of position.

Moving the patient back to the upper mattress

The edge of the upper mattress is drawn as close to the patient's body as possible, with its overhanging edge on the opposite side supported on the bedside stand.

Again one nurse encircles the patient's shoulders and back with both arms and the other nurse the patient's pelvis and thighs: together they move the patient onto the upper mattress.

The upper mattress is now drawn into position, even with the lower one. The patient, still enveloped in the bedclothing, is moved to the middle of the bed and towards the head, so that the bedclothing will be in position for proper readjustment.

WHEN ONE MATTRESS IS USED

When a single mattress is used over a spring bed, the same procedure may be carried out. A folded bed puff, blankets, or several feather pillows placed lengthwise over the springs will serve in the place of the mattress.

V

PREPARATION OF PATIENT FOR THE NIGHT

Purpose

To refresh and give comfort to the sick patient.
To prepare for uninterrupted rest and sleep.

Equipment

patient's towel
face cloth
toilet basin
mouth wash solution
mouth wash cup
orange wood stick
absorbent cotton
kidney-shaped basin
talcum powder
bathing solution
whisk broom
} carried in agate basin
pitcher of cold water
drinking tube
extra blanket
hot water bag if necessary

Carry equipment to bedside.

PROCEDURE FOR TOILET OF HELPLESS PATIENT

Care of face and hands

If patient has not his own soap, prepare a slightly soapy solution of warm water in the basin.

Place towel under patient's chin.

Place wash cloth in basin and wring partially dry.

Cleanse the eyes, changing part of cloth for each eye to avoid possible infection.

Dry immediately with towel.

Rinse cloth and slip over right hand with ends tucked in, steady head with left hand and wash face, including neck and ears, with relaxed wrist and firm touch.

Rinse cloth and wring out tightly; go over face the second time. Dry gently.

Place the basin on the bed and wash hands and arms. Dry off with cloth, using towel as before. If arm spaces are included, follow with powder.

Care of the mouth

Preparation of mouth wash

Use one part solution to three parts warm water.

With tooth brush

If possible, the patient's tooth brush and dental floss should be used. Moisten the tooth brush by immersing in the warm solution before using.

Place towel under patient's chin.

By standing slightly back of the patient's head the nurse can manipulate the tooth brush with her right hand and brush with an up and down motion.

With absorbent cotton swabs

If patient is too ill to have tooth brush used, the mouth should be cleansed with absorbent cotton swabs. Those used for the tongue and gums are larger than those for the teeth.

To prevent the swab from slipping off into the patient's mouth the sharpened end of the orange wood stick is moistened in the solution.

Twist a small piece of absorbent cotton securely around the point of the orange wood stick or toothpick, seeing that the point is well covered, and dip into the solution.

Before introducing into the patient's mouth the superfluous solution is pressed out of the swab against the inner side of the cup. After using never dip a swab the second time into the solution.

The upper and lower teeth, back and front, are cleansed as with a tooth brush, using at least four swabs for the operation.

From the orange stick the swabs are removed with several folds of tissue paper, or forceps, and placed in a receptacle to be burned; when toothpicks are used a fresh toothpick is used with each swab and both are burned.

The patient should now rinse his mouth with the remainder of the solution. The nurse supports the patient's head with the pillow and places the cup to his lips. His head is then lowered and the kidney basin is placed in position to receive the solution after the mouth is rinsed.

Dry the patient's lips and remove the towel.

Care of false teeth

Remove after each meal and cleanse with tooth brush and tepid water, then rinse with two per cent boric solution or bicarbonate of soda solution. When not worn by the patient keep in two per cent boric solution.

After care of materials

The materials just used are removed to the lavatory and disposed of.

All fluids are emptied into the hopper.

In ordinary cases wash all utensils with hot suds, scald, dry and put away; otherwise, in precaution cases, sterilize. Keep toilet utensils for that special case.

The face cloth is washed and the tooth brush or orange wood stick is scalded and returned to patient's bedside.

Care of the hair

For a woman

Place a towel under the side of the head to be combed first. Comb or brush, beginning at the end and working upwards as near as possible to the roots of the hair, then comb the scalp, gradually combing towards the end of the hair.

Braid loosely near the head and more tightly towards the end.

Secure with ribbon, bandage or elastic band.

Wrap combings in toilet paper and place in receptacle to be burned.

For a man

The hair should be brushed, combed and parted neatly.

Care of the body

If the patient is sensitive to cold, the bathing solution may be warmed by loosening the cork and placing the bottle in hot water.

If the patient from necessity maintains the dorsal position, he should be bathed from each side, the body being raised as much as possible; otherwise roll him over on his side and saturate the corner of the towel with bathing solution.

Rub the back by starting at the neck and rubbing with a firm, circular motion as far as the end of the spine. Follow with powder.

Heels, elbows and knees should be inspected for redness and be treated.

While the patient is still on his side brush off the draw sheet, placing the hand against the patient as a guard against the whisk broom.

Note: The hands should be used in place of a towel or broom for the removal of crumbs which may be felt under the patient's body.

Care of the bed

Brush cotton draw sheet, using the hand to remove crumbs from under the patient. Then loosen both draw sheets together. Inspect cotton sheet for moisture and if necessary, change; otherwise re-tighten each draw sheet separately.

Roll patient on completed side of bed and step to opposite side.

Brush, loosen and re-tighten draw sheets.

Move patient to middle of bed. Support his head while removing both pillows together. Shake and replace them.

Readjust upper bedclothing.

Apply doubled extra blanket over foot of bed within patient's reach.

Note: If a hot water bag is in use, it should be refilled at the official temperature.

Arrangement of bedside

Have nothing on the table but the articles needed during the night, *i.e.,* small pitcher of fresh water and drinking tube, hand bell if required, and table drawer within the patient's reach.

Final details to be remembered

In connection with the patient

If permissible, a cool sponge bath is refreshing at bedtime in warm weather in place of the local bathing.

See that all wants are attended to before leaving the patient, so that he may feel settled for the night. It is only in extreme cases that patients are disturbed for medicine, temperature or treatment of any sort.

Fasten a handkerchief to the patient's nightgown with a small safety pin, as otherwise it may be mislaid.

In relation to room and ventilation

Ventilate by pulling down the windows from the top and raise from the bottom as high as the window board.

The temperature for comfort at night should not be over 68° in winter. For the protection of the patient in cold weather when full ventilation is desired (as in cases of pneumonia) and when the muslin bed curtain is not sufficient, a sheet or blanket may be used to drape the head and sides of the bed.

Unnecessary noises: Report windows with loose pulleys, as a rattling window may be a source of annoyance. Wedge, in the meantime. Squeaking door hinges may easily be oiled. Door stops should be used where there is danger of a door slamming, as sudden noises are startling.

PROCEDURE FOR TOILET OF CONVALESCENT PATIENTS

Place at each bedside an empty basin; follow with an agate pail of tepid water slightly soapy.

Pour sufficient in each basin to wash the face and hands.

Prepare mouth wash solution for a number of patients, a cup for each. Carry to the bedsides on a large tray and distribute.

Place tooth brush in the solution cup and see that the patient is provided with a towel.

Bathe the backs of those who have been confined to bed all day.

Brush out bed, tighten draw sheet, shake up pillows, supply extra blanket.

AMBULATORY PATIENTS

Those who are up all day wash face and hands and cleanse teeth in the lavatory.

Turning down bed for the night

In the case of a convalescent or new patient, reach under both pillows and turn upper bedclothing down to within two feet of foot of bed. Fold down the second time and back on itself, forming a double box plait.

Place an extra blanket over the foot.

VI

CONTRIVANCES FOR THE SUPPORT AND COMFORT OF THE PATIENT IN BED

In using all these appliances and substitutes the nurse must not lose sight of the importance of the care for the patient's skin in bathing, rubbing and keeping dry, for which there are no substitutes.

GENERAL CONDITIONS

In cases of restlessness and nervous fatigue

Tuck a pillow, large or small, on either side of the patient's body, on which he may rest his arms. Filled and covered hot water bags at body temperature make a good substitute.

To prevent slipping down in bed

In ordinary cases of weakness to keep the patient from slipping down in bed, the foot of the bed may be raised four or five inches on blocks. Or a sheet may be folded on the bias, stretched over the mattress close to the patient's feet, and tied firmly to each side of the bedstead. A small pillow or tightly rolled blanket may be introduced between the folds of the sheet to serve as a brace for the patient's feet.

To keep a helpless patient on his side

The patient's hips should be well drawn back and the knees carried slightly forward and somewhat flexed.

Small pillows or folded sheets may be placed between the knees and ankles to prevent contact of opposing surfaces. For support of the back in place of a bolster, an ordinary feather pillow may be folded lengthwise, tied together at each end with tape or bandage, and firmly wedged against the patient's neck, shoulders, and back.

An improvised surgical cradle

An empty soap box may be used with one side knocked out. It should be sufficiently deep and wide for the comfort of the patient. The bottom of the box may be padded to serve as a support to the feet, the other three sides forming the arch to support the bedclothing.

SPECIAL CONDITIONS

For support of head and neck

When the patient must keep the flat, recumbent position, use small down, air, feather or hair pillows for slight elevation.

In cervical fractures when the head must be supported on both sides, use small, padded sand bags, salt bags or a rubber ice collar filled with either salt or sand. A dumbbell-shaped hair pillow is excellent, as the narrow part fits snugly under the neck and gives support, while the two bulbous ends hold the head in position.

For support of a painful shoulder

A small down pillow may be used or the corner of an ordinary feather pillow may be smoothed and flattened to serve as a wedge between the patient's shoulder and the

bed. As substitutes, a smoothly folded blanket or sheet, an air ring or cushion, a hot water bag at body temperature filled sufficiently to serve as a support.

For support of a septic hand

A feather pillow on an inclined wooden plane.

For support of the back

Dorsal region

In paraplegic or emaciated cases a firm, flat, smooth, hair or feather pillow, extending under the patient from shoulder to hips on either side of the spine, may be used to prevent contact with the bed.

Lumbar region

Small pillows, a smoothly folded sheet or blanket slipped under the arch of the back; or an ice collar or hot water bag filled with cool or warm water, depending on which affords the greater comfort, have been the means of great relief for backache following operation.

Sacral and coccygeal region

An inflated air ring, a large or small feather pillow (protected with a rubber case under the pillow cover) placed lengthwise under the patient.

For support of a pendulous abdomen

When the patient is lying on his side a pillow, large or small, may be smoothed flat, and pressed under the edge of the abdomen, with the upper leg flexed upon the end of the pillow.

For support of the knees

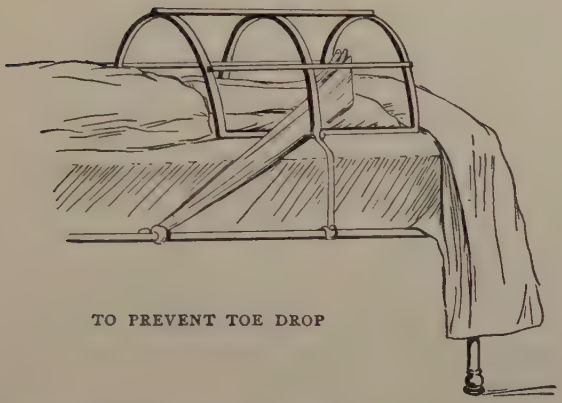
To relax abdominal muscles following operation, or for restful change of position, use a firm rubber-cased pillow or small hair bolster under the knees and against the back of the thighs. Two blankets rolled together, tied at each end and confined in a pillow case, will serve as substitute for a bolster.

For support of lower extremities

Place a rubber-cased feather pillow lengthwise from the back of the knees and extending beyond the patient's heels. This simple measure will relieve the body of the dragging weight of paralyzed limbs and prevent pressure of the bed against the heels. A surgical cradle may be used to support the weight of the upper clothing over the feet.

To prevent toe drop or foot drop

Place under both feet a feather pillow, lengthwise, and over the feet a surgical cradle which should be tied to each side of the bed. Fold a large sheet obliquely and introduce each end through the open space of the cradle on either side, the broader surface of the sheet against the soles of the patient's feet. The sheet should be held taut and the ends tied to each side of the bed. A piece of heavy cardboard or splint wood is introduced between the upright folds of the sheet to serve as a brace. It should be broad enough for both feet and extend beyond the toes, as in the foot piece of a posterior wire splint. It may be padded.



TO PREVENT TOE DROP

For support of a septic foot

Use a rubber-cased feather pillow on an inclined wooden plane. Over this is placed a surgical cradle, and owing to the height of the inclined plane, it should be placed on end and held in position by a bandage tied to each side of the bed. As a substitute, an ordinary feather pillow may be used, its extreme end elevated by a folded sheet or blanket, or by two or three magazines, to give the desired elevation.

To keep a delirious or restless child in bed

A sleeveless waist made of Canton flannel or unbleached cotton is buttoned down the back with flat buttons. Attached to the center of the waist line should be a belt of cotton webbing six inches deep and long enough to fasten to both sides of the bed or cot. The belt should be stitched on at the waist line across the width of the webbing, covering five inches of the waist across the front, for security allowing not more than half-inch spaces between

each row of stitching. This waist is worn over the patient's nightgown or shirt.

This form of restraint is perfectly safe, and does not interfere with the comfort of the patient, as it allows freedom of the arms and legs, as well as limited motion from side to side, and brings no direct pressure upon the body.

For protection in the restlessness of chorea two boards, as long as the bed and one and one-half feet wide, should be notched at the extreme ends and secured at these points to the bed. The inner side of the boards should be padded with folded blankets or pillows, which may be held in place by bandages. The head of the bed may be covered with a thick blanket and sheet securely held in place with safety pins, or a pillow may be tied to the rungs of the bed with a bandage at each end.

VII

BED WITH CRADLE

Purpose

A bed is made with a cradle for fractures and sprains of the lower leg, and for such cases as arthritis and phlebitis, in which the weight of the bedclothing would be a source of discomfort.

In the case of a fracture of the lower leg, when not feasible to suspend the injured limb, the bed is made up with the following equipment added to the usual requisites for bedmaking.

Equipment

2 or more fracture boards
2 sand bags
rubber-cased feather pillow
surgical cradle
blocks when needed for traction

Fracture boards are used with a spring bed and are about 12-15 inches wide. They are made to reach from one side of the bed to the other, under the springs, for firmness and even support. A wooden cleat an inch or more deep nailed on each end of the board rests on the framework of the bed when in place, and serves to raise the board under the springs and prevent sagging. The board is perforated to permit ventilation. Two fracture

boards are used at a time, one above and the other below the point of fracture.

Old-fashioned bed slats are sometimes used in place of regular fracture boards.

Sand bags and pillow are to hold the injured limb in position. The surgical cradle is to elevate and support the upper bedclothing.

Preparation and procedure

This bed is made in the same order of procedure as any other bed except in the arrangement of the upper bedclothing, which is made to conform to the surgical cradle.

The chair, table, and linen are arranged as usual. The upper sheet, draw sheet, and pillow case are to be changed.

Making upper part

The upper bed coverings are loosened and the spread removed as usual. The top pillow is removed and placed on chair. Top blanket is removed and draped on back of chair. The remaining blanket and sheet are folded back from foot over the cradle cornerwise on the side of the injured leg. The upper bedclothing is supported with the left hand. To avoid striking the foot, the cradle is tipped forward at its lower edge, removed and placed under the bed, and the bedclothes replaced. The sand bags come next.

The nurse now places her extended hand and forearm along the side of the injured leg, grasps it firmly, elevates it in a straight line from the thigh, and with the free hand slips out the pillow. She then replaces the leg carefully and steadily on the bed. The fresh sheet and blanket are

put on as usual. The soiled sheet and blanket are pushed down to the waist line. If the fracture is on the right side, the fresh sheet and blanket are elevated by the left hand and the soiled sheet removed diagonally from the opposite side of the bed to prevent contact with the injured leg. The top sheet, if not soiled, is folded for a draw sheet and the blanket is draped over the arm of the chair.

Care of the back

If the fracture is below the knee, the patient may be able to turn his body slightly to have his back bathed and powdered, which is done from the uninjured side.

Making the under part of bed

The under part is made from the sound side first. The patient's head is supported and the pillow is moved slightly toward opposite side of bed. If the injury is below the knee the patient is instructed to grasp the lower rungs at the head of the bed with both hands while the nurse with both hands supports the injured leg above and below the point of break, keeping the leg in a straight line, with slight traction, and following the patient as he moves slowly to opposite side of bed.

The procedure is as usual; the sheets to be changed are pushed as far as possible under the uninjured side, which will facilitate the final removal on opposite side, as the patient may not turn. On the completion of the first half, the patient is again moved as already described, and the second half is completed.

The final move is assisting the patient to the middle of the bed, when he may be moved up on the pillows. As he supports himself on the rungs of the bed, he may draw

his body up while the nurse supports the injured leg. The nightgown is changed and clean case put on the pillow, which is shaken and arranged to suit the patient's comfort.

Arrangement of the fractured leg

The pillow with the rubber case is shaken up, smoothed and grooved in the center lengthwise by making pressure with both arms. The sides are then held together in order to maintain the groove. Standing on the side of the injured leg, facing the foot of the bed, the free forearm is placed alongside the leg to brace it, while the leg is grasped firmly, bridging the break, extended and raised. The pillow, with its closed end first, is inserted lengthwise and drawn up beyond the popliteal space. The leg is now steadily lowered so that it rests in the groove of the pillow.

To prevent overpressure on the heels the pillow should be slightly bolstered upward at the projecting end, or a heel ring be used if more comfortable. The sand bags are replaced under the pillow, the longer one on the outer side of the leg, the shorter one on the inside, so arranged that thorough support is secured.

The surgical cradle is now placed in position, reaching to the foot of the mattress if the patient is an adult, otherwise it may be moved higher in bed to suit the length of the patient.

Arrangement of upper bedclothing

The top sheet and blanket are re-adjusted and tucked in at the foot. The extra fullness of the sheet outlines the edge of the cradle in a fold, and a square corner is made as usual. If on account of the height of the cradle the

first blanket cannot be tucked in at the side, the second or third blanket, as it may be, is put on crosswise to supplement, and arranged as the sheet in outlined folds over the edge of the cradle, with fullness carried to the sides of bed and tucked in securely. The spread is put on as usual with the exception of arranging it at the foot of the bed in an outline fold along the edge of the cradle, from which it hangs at the side in free straight folds.

Final details

The patient's towel is placed in position on the lower rung behind the pillow. The bedside table and furniture are left in order, the soiled linen is removed.

Early observations in fracture cases

Report any abrasions of the skin so that they may be attended to at once to prevent infection and bedsores. Keep the patient clean and dry by bathing and powdering the back twice a day and more frequently if there is indication of redness of the skin.

See that the patient holds his position in relation to the fracture as the surgeon has ordered.

In caring for the patient at bedtime, the cradle and pillow should be removed for re-arrangement, to insure comfort and rest during the night.

BED WITH A BALKAN FRAME AND OVERHEAD SUSPENSION

A Balkan Frame is a rectangular wooden, or metal, overhead bed frame, reaching nearly to the floor, and fastened to each corner of the bed with iron clamps or

bandages. It was first introduced during the Balkan war in 1911.

Purpose

It serves as a support for the attachment of pulleys, ropes, weights, and counterweights, by which a fractured limb, or injured joint of the upper or lower extremities, may be suspended above the surface of the bed in a heavy wire splint, usually a Thomas splint, and canvas hammock or sling. Hanging from the overhead frame, within easy reach of the patient, are stirrup-shaped hand grasps which enable the patient to change his position from side to side, or by which he may be raised in bed for any purpose or may raise himself horizontally or to a sitting position. This changing of position is to be encouraged by the nurse, as it promotes circulation and is a definite factor in preventing bedsores and hypostatic pneumonia.

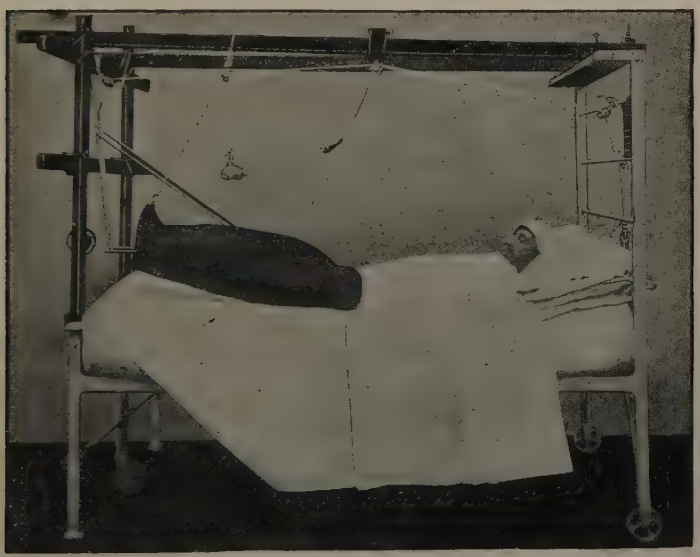
Method of making a Balkan Frame fracture bed

With a fracture of the upper extremities no change is necessary in making the bed. With fractures of the lower extremities, the under part of the bed is made as usual. In making the upper part the usual application of the bedclothing is impracticable because of the suspension of the fractured limb above the surface of the bed.

Two sets of bedclothing are used, and they are applied in two cross sections—an upper and lower, corresponding in terms to the part of the body covered. The upper section covers the patient above the shoulders and reaches to the thighs, or as far as the ropes and pulleys of the sus-

pended limb will permit. The lower section starts where the upper section leaves off, and covers the uninjured leg. It reaches across to the opposite side of the bed under the suspended leg and over the remainder of the bed, and is tucked under the foot of the mattress.

Each article of bedclothing is folded in two, hem to hem. The folded edges of the upper and lower sections



BED WITH BALKAN FRAME

are pinned together across the middle of the bed, on each side of the fractured limb. The folded edges of the two spreads are also pinned together with large safety pins close enough to prevent uncomfortable open spaces. Guard against any interference with the ropes which con-

trol the traction. The hems of the sheet of the upper section are turned over the spread at the top. The spread of the lower section is tucked under the mattress at the foot. The corners are turned, and the spread hangs at the side of the foot of the bed in the usual slanting folds.

The suspended limb, if not encased in plaster, is enveloped for comfort in flannel or sheet wadding.

In cases of fracture of lower extremities when both limbs are suspended, the under part of the bed is made as usual, the patient elevating himself by means of the overhanging hand grasps. In applying the upper bedclothing the same rule is carried out in the arrangement of the upper cross section as in the single fracture, covering the patient's body as far as the thighs of both suspended limbs. A spread will serve to cover the lower part of the bed under the elevated limbs, and is tucked under the foot of the mattress. Finish sides in slanting folds, and turn back as in an open bed.

The Rainbow extension fracture bed

In making a bed with a Rainbow attachment, the same rules are carried out as in the making of the Balkan Frame bed, except in cases where the apparatus may interfere with the cross section method. In that case each article of the upper bedclothing is folded in two, lengthwise, in two separate sets, one division being the duplicate of the other. The folded edges are approximated with safety pins from the top, and as far as the suspended fractured limb, which must protrude between the two sections of bedclothing without interference to position. Finish by pinning as close to the fractured limb beneath

as the apparatus will permit, and down as far as the foot of the bed, where the bedding may be neatly arranged in the usual manner. For security the two spreads may be pinned together apart from the underlying bedclothing.

VIII

MAKING OF AN ETHER BED

Purpose

An Ether Bed is one that is prepared for a patient who is recovering from the effects of an anæsthetic, usually ether, following a surgical operation.

Equipment

2 gray blankets
1 half sheet
2 rubber pillow cases
dressing towel
washed gauze
3 hot water bags
kidney basin
round agate basin
wooden gag
shock blocks

Preparation of bed

Under part

The bed is made as usual. Without removing the pillows the upper bedclothing is turned down to the extreme foot of the bed in a double box plait. The first gray blanket is put on crosswise, so that it may be tucked in securely on each side. The lower corners of the blanket are turned under to permit its introduction to the foot of the mattress without disturbing the upper bedclothing. The selvage edge of this blanket should reach under the pillows at the top. A half sheet is folded 20 inches wide and serves as a narrow draw sheet

between the patient's hips and the rough woolen blanket underneath.

Pillows

The rubber cases are drawn over the pillows. The first pillow has its cotton case put on in the usual way. The second pillow has its case put on in the opposite direction

OPEN ETHER BED BEFORE REMOVAL OF HOT WATER BAGS

to the rubber case, so that each end of the pillow is encased and protected. Place the first pillow on the bed with its closed end towards the table. The second pillow is placed lengthwise on the side opposite the table, with its closed rubber end towards the foot of the bed, overlapping the first pillow at the head. This pillow serves to

support the patient in a semi-lateral position while under ether. If the shock blocks are used for elevation of the foot of the bed, an additional pillow should be bound to the head of the bed to prevent pressure of the patient's head against the frame of the bed.

Upper part of bed

The upper gray blanket is put on in the usual way. Turn the lower corners back at acute angles and slip under the upper bedclothing even with the foot of the mattress, but do not tuck in, so as to afford easy removal without disturbing the rest of the bedding. Turn back the surplus blanket at the top over itself to prevent coming in contact with the patient's face.

Warming the bed

Fill three hot water bags with water of a temperature sufficient to heat the upper and lower bedclothing. Force out the air and test for leakage. Two bags are placed in the middle of the bed, the third at the extreme foot.

In order to get the upper bedclothing warmed, the gray blanket is pulled up into position over the hot water bags, followed by the bedclothing.

If only one bag is available, move it about the bed at ten-minute intervals. The number of bags should be noted on a tag and pinned on the outside of the bed so that none may be overlooked on reception of the patient. If the patient is delayed, refill the bags.

By the installation of blanket warmers and the use of hot blankets in place of hot water bags all danger of burns from the bags is avoided.[1]

[1] This practice is followed at the Massachusetts General Hospital.

Arrangement of equipment on table

Six or more pieces of washed gauze are folded separately and placed on the right upper corner of the table. The dressing towel is folded diagonally and placed at the lower corner of the table. The kidney basin is turned upside down and placed behind the towel. The wooden gag is placed between the towel and the basin. A space is left for the post-operative report chart. On the shelf underneath is placed the round enameled basin for the reception of the soiled gauze.

Accessories

The shock blocks are placed on the floor at foot of the bed, one beside each leg, ready for use if needed. Table and chair are moved from bedside to afford clear passage way on the arrival of patient.

IX

SITTING A PATIENT UP IN BED

Purpose

To aid a convalescing patient in recovery of strength.

For relief of dyspnœa.

For the prevention of hypostasis.

To facilitate free drainage of wounds following operation on the thoracic and abdominal cavity.

For change of position and comfort of patient following a breast operation.

Equipment

2 iron rods	large sheet
canvas support	2 small hair or feather pillows
rubber pillow case	shoulder wrap
safety pins	

Slip ordinary pillow into rubber case, place in the middle of a diagonally folded sheet and envelop pillow, twisting the extended corners of the sheet two or three times to secure the pillow, ready for later use as a thigh support.

Procedure

Moving the patient to adjust headrest

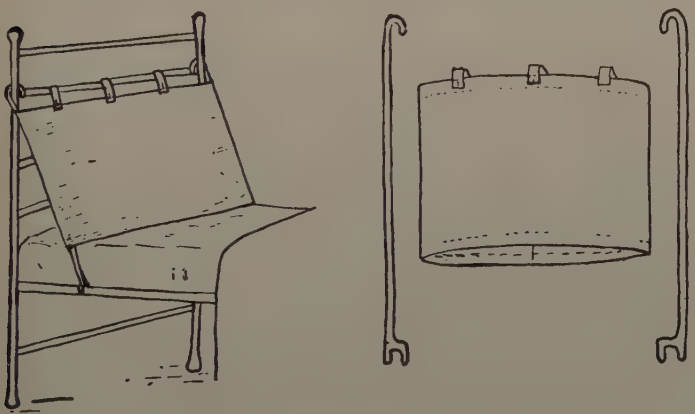
Move table out from bed. Loosen upper bedclothing half way down and turn back at patient's waist line. Re-

move top pillow. Pass one arm over the patient's shoulder and under his opposite arm, grasping firmly. Instruct the patient to draw up his knees, brace feet, and hold his body rigid. Bend a trifle forward with knees slightly flexed, and with foot braced as if ready to step. Instruct patient to pass his arm under yours and his opposite arm over your right shoulder and clasp his hands. With the free hand under the patient's sacrum, taking one or two side steps, slide him down in bed as far as possible. Draw down the remaining pillow and place under the patient's head until the headrest is adjusted.

If a second nurse assists in moving the patient she stands on the opposite side of the bed.

Headrest

The headrest consists of two iron rods with an adjustable and tightly stretched canvas between them. The canvas is double and made after the fashion of a roller towel. Buckles and straps are sewed to its upper edges.



HEADREST

The rods engage the upright and side frame of the bed, one rod on each side. The canvas is stretched while placing it in position. The headrest can be stored in a very small space when not in use, and the canvas can be easily laundered.

Adjustment of headrest

Slip the first iron rod through one side of the circular canvas and adjust to upright head of bed. Step to the opposite side of bed and do the same with the second rod, and while on this side attach the lower end of the rod to the side frame of bed. Return to the first side and complete adjustment of the lower end of the first rod in the same manner. Owing to the tension on the canvas, this procedure is necessary in order to secure it to the bed. Buckle the supporting straps on the upper edge of the canvas to the rung of the bedstead to hold in place.

Moving the patient up on the headrest

Stand at the patient's right if possible. Remove the firmer pillow, hold horizontally and shake the feathers to the lower edge. Place in position at the lower edge of the headrest. If able to move the patient without help, place one arm under his flexed thighs, and the other over the nearest shoulder and under the opposite axillary space. The patient may support himself by either grasping the nurse's nearer arm above the elbow with both hands; by placing his hands palms down on the bed; or by grasping a suspended support from the head of the bed with both hands. This support may be made of webbing about five inches broad and be attached to the rung of the bed over the patient's head.

Arrangement of pillows and shoulder wrap

Support the head and shoulders with the second pillow. In order to prevent the patient from slipping down in bed, the thigh support is slipped under the patient's flexed knees and braced firmly against the back of the thighs. Give a couple of twists to the free ends of the sheet, slide under the canvas headrest at each side, and tie securely to the upright of bed.

An improvised wrap is made from the shoulder blanket. Fold back the border, place about the patient, finish at the neck with a narrow rolled collar of the blanket and pin down the front. The border makes the collar with lapels. Pointed cuffs are made by folding back the corners of the blanket at the wrist and fastening with a safety pin. This arrangement permits the patient to move his arms about freely without exposure or restriction.

The corner of a small pillow is tucked in on each side of the patient, the remaining part of the pillow serving as an arm support.

The final touches are given the bed.

Arrangement of bedside table and accessories

The bedside table is moved down. The table drawer and necessary articles should be within easy reach of the patient, especially drinking water, and hand bell if not near electric push button.

When the permanent headrest is in use, as in cases of pneumonia and cardiac conditions, the adjustable bedside table is preferable, as it may be placed across the bed and on it a pillow may be laid to support the patient's arms in conditions of dyspnœa.

Observation of the patient

Note pulse, color, signs of fainting or dizziness. If sitting up for first time, to avoid over-fatigue, twenty to thirty minutes is long enough, unless otherwise ordered by the doctor.

If an abdominal case, note binder and adjust before sitting the patient up.

When patients are obliged to be in the sitting position day and night, they should be closely observed for pressure sores and preventive measures be taken in the daily care. Frequent bathing, change of position by slightly tipping to one side at four hourly intervals during night and day, by use of pads and air rings (the latter should be in good working order) are some of the preventive measures employed.

To make a bed without removal of headrest

The upper part of the bed is made as usual. In making the under part the patient and pillows are moved to the opposite side of the headrest and the patient is turned on his side. The first side of the canvas support is unfastened if necessary at the top, and the lower end of the rod is unclamped from the side of the bed frame below and placed on the bed. The rod which is hooked on the upright frame of the bed is left undisturbed.

The under part of the bed is then made as usual and when completed the iron rod is replaced and the canvas support refastened. The patient is moved over to the finished side of the bed when the same procedure is carried out. The patient is finally moved to the middle of the headrest and the bed completed.

Improvised headrests

A hard wood board as wide as the bed and three feet deep, padded with an old blanket and covered with a sheet, may be placed against the head of the bed in a slanting position and serve the purpose of a headrest very well. If difficult to hold in position bore auger holes at each end large enough to permit the introduction of fine rope or webbing, and attach to head of the bed.

A common kitchen chair with a firm back may also be used, turned upside down. A double half sheet may be bound around the spaces between the legs, which will prevent damage to the head of the bed and will keep the pillows from slipping. Place the pillows lengthwise against the chair with an additional small pillow for the head.

Removal of the headrest

For the removal of the headrest the patient is moved down in bed as in the procedure of adjusting the headrest. The iron uprights and canvas are removed. The pillow under the patient's head is taken out and placed against the head of the bed, standing on its side, to prevent collision of the patient's head with the bed while moving him up. When he is in position the pillow is drawn under his head by its lower edge, and the other pillows added. The patient's condition is noted and the bed straightened out.

X

TO GET A PATIENT INTO A CHAIR

Purpose

As an aid in progressive convalescence.

For change of position and comfort in chronic conditions.

For the relief of dyspnœa.

Equipment

a comfortable wrapper
woolen petticoat or pyjamas
slippers and stockings
2 gray blankets
2 feather pillows or one pillow and an air ring
rubber pillow case
large comfortable chair
hand bell
necessary linen for changing the bed as soon as the patient sits up

Preparation of the chair

Remove the upper pillow from under the patient's head. Slip on the rubber case and place on the seat of the chair crosswise. Place first blanket crosswise over the back of the chair, allowing about 18 inches to hang freely over the back. Arrange second blanket across the seat of the chair and high enough to pin about the patient's waist,

which will be sufficiently long to envelop the feet. Place the chair with its back parallel with the foot of the bed and far enough from the side to permit the nurse to step between it and the chair. If a rocking chair, a sand bag may be placed under each rocker to steady it.

Preparation of the patient

The upper bedding is loosened, spread removed and folded as usual. Remove one blanket. If a patient with an abdominal wound, see that the binder and perineal straps are secure.

The patient is dressed from the feet up with the exception of the wrapper. Turn back each corner of the blanket and sheet at the foot of the bed and dress the patient's feet. Insert the hand into the toe of each stocking and turn it inside out as far as the heel. Slip the foot of the stocking over the patient's foot as far as the heel and gradually draw it up into place. Pull the nightgown down about the patient's knees.

The pyjamas or petticoat are drawn over the feet. When the hips are reached the patient braces the feet on the bed and slightly raises the body, which enables the nurse to adjust the underwear at the waistline.

Before putting on the wrapper it should be unbuttoned down the front and rolled up at the back from hem to arm spaces. Slip the rolled wrapper behind the patient's neck and towards the arm which is to be first inserted into the sleeve. The nurse inserts her hand into the sleeve of the wrapper and grasps the patient's hand and cuff of the nightgown, and draws them through the sleeve. The rolled wrapper is now drawn towards the second arm and the same process is carried out. The

shoulders of the patient are supported, and the wrapper unrolled towards the waistline. Finally the patient flexes the knees and raises the hips, and the wrapper is pulled down smoothly to the ankles and fastened up in front. If it is a closed wrapper it should be gathered up at the back and put on in the same way as a closed nightgown.

The upper bedclothing may now be folded back to the foot of the bed.

Note the character of the patient's pulse now, especially if getting out of bed for the first time.

Getting the patient out of bed

With one hand behind the patient's shoulders, slowly elevate the body into an upright position, while with the other hand over the knees the feet are drawn over the edge of the bed. Permit the patient to rest a few minutes in this position, supported by the nurse, in order that he may regain his equilibrium and overcome the sense of faintness or dizziness.

The patient's pulse is again noted. If the nurse is getting the patient up without assistance, she stands close at the patient's side and slips her arm over the patient's shoulder nearest to her, and under the opposite arm. Her second arm is passed under the patient's knees. The patient supports himself by clasping his hands firmly about the nurse's shoulders. The nurse then turns to the right, which should bring her parallel with the side of the chair in which she places the patient.

Assistance should be obtained when sitting up a patient who cannot step on the floor; the reasons are obvious, as it is no longer considered heroic for a nurse to strain her back in lifting or carrying burdens beyond her strength.

Lifting a patient from a bed into a chair on a sheet

A large sheet is folded lengthwise 18 inches wide. With the patient sitting on the edge of the bed, a nurse and her assistant stand on each side of him and slip the center of the folded sheet under his hips. The ends of the sheet are rolled close to the sides of the patient. He is instructed to place his arms around the shoulders of those lifting. They grasp the sheet firmly with both hands and lift the patient into the chair. The sheet is left under the patient ready for his return to bed.

This method of moving the patient gives assurance of safety, prevents sagging, and lessens the strain in lifting.

LIFTING A PATIENT INTO A CHAIR ON A SHEET

Arrangement of the blankets

The first blanket is pinned around the waist and down the side, folded under the patient's feet and pinned comfortably behind the ankles.

The shoulder blanket is pinned as described in sitting the patient up in bed. The second pillow is placed open end down behind the patient's back. The chair is moved from the bedside and placed facing a pleasant outlook whether it be door or window, as a change of scene is always welcome to the shut-in or convalescent patient.

Accessories for the comfort of the patient

Move the bedside table within easy reach, with drawer towards the patient. Place a pitcher of fresh water and a drinking tube on the stand. Add a hand bell if the patient is occupying a room and sitting where he cannot reach the electric push button.

If the bed is made up with two mattresses, turn both. Make bed at once, in case of need. Fold back upper bedclothing to extreme foot of bed, ready for the reception of the patient later.

Assisting the patient back to bed

When it is time for the patient to return to bed, the chair is moved close to the bedside. The back of the chair should be parallel with the foot of the bed. The outside coverings and pillow behind the patient's back are removed, and the pillow placed on the bed.

If the patient's chair is lower than the bedside, the nurse should have assistance in getting the patient into the bed; otherwise if the patient is not too heavy or help-

less, she may manage alone by placing her arm behind the patient's shoulder nearer to her and extending it towards the opposite arm. The second arm is slipped under the patient's knees. The patient in turn supports himself by firmly clasping his hands over the nurse's shoulders. The patient should be instructed to hold his body rigidly.

The nurse with knees slightly flexed bends over, raises the patient out of the chair, takes one step sidewise, and a few steps forward, which should bring her to the side of the bed, on which she places the patient. She slowly lowers his shoulders onto the pillow, while with the other hand the lower extremities are lifted and extended towards the foot of the bed. The bedclothing is partially drawn up over the patient, who is then undressed in the same order as he was dressed, the wrapper being removed last of all by rolling it up under the body as far as the shoulders, when the nurse reaches over and draws the gown up to the back of the neck.

The nurse slips her hand into the arm hole and supports the patient's elbow, while with the other hand she slips off the sleeve. One hand is introduced through the opening of the wrapper, and placed on the crown of the patient's head to prevent contact of the wrapper with the face. With the second hand the nurse slides the opening of the wrapper over her extended hand and behind the patient's neck, when the second sleeve is easily slipped off.

The nightgown and upper bedclothing are now adjusted, the rubber case removed from the second pillow, which is placed under the patient's head.

The pulse and the patient's general condition are noted.

One hour should be the maximum time permitted for a patient to sit up on the first day. Before, or at the end

of thirty minutes, note the pulse for its quality, and whether or not it is increased in rate. Observe the facial expression and general attitude for fatigue. If the observations made are unfavorable, do not wait for the completion of any special time, but get the patient back to bed.

To dress a patient in blankets to go out in a chair

The patient may be fully or partially dressed according to the season and the stage of convalescence. One should err on the safe side, and overdress rather than underdress the patient.

PATIENT DRESSED IN BLANKET TO GO OUT IN A CHAIR

The arrangement of the chair and pillows is much the same as in getting the patient out of bed, with the exception of providing an extra wrap under the blankets. The first blanket is so arranged that it may serve as a wrap for the patient's shoulders, and head-covering or improvised hood in one. In order to do this the blanket is placed crosswise over the

chair, allowing about 20 inches of the selvage edge to hang over the back. After the usual arrangement of the pillow and second blanket the patient is moved into the chair. The blanket is pinned at the patient's waist, and down the front or side. Sufficient allowance should be made to turn part under the patient's feet, in which may be enveloped a hot water bag or heated soapstone for comfort in cold weather.

A dressing towel is applied as a covering to the patient's head. It is secured at the back of the neck with a safety pin. The overhanging selvage edge of the first blanket is carried over the patient's shoulders on each side, leaving sufficient at the back of the neck to make the hood. This is done by pinning the two selvage edges together at the back of the patient's neck with a safety pin, thus making a circle for the hood, which is carried over the patient's head.

The selvage edge is folded back, and the hood is fitted neatly about the patient's face. The remaining fullness at each side of the head is gathered into folds and pinned under the chin. The blanket is again pinned over the chest. The bordered ends of the blanket which hang over the side of the chair are brought over the knees of the patient. The center of each end makes a sleeve by folding back a cuff sufficiently wide to envelop the patient's wrist, and also to allow for the insertion of the hands in the opposite sleeve for warmth if desired.

XI

ROUTINE CLEANING FOLLOWING THE DISCHARGE OF A PATIENT

Purpose

For cleanliness.
For the reception of a new patient.

Bedside preparation

basin of 2% formaldehyde solution, 6 ounces
pail with hot, soft, soapy solution
washed gauze sponge
whisk broom
2 laundry bags
rubber table cover, or newspaper

Procedure

Strip the bed, inspect blankets to determine if fit to use again without laundering; reserve for bedmaking, or place in blanket bag.

Dampen brush in formaldehyde solution and brush the hair mattress on all sides; when brushed remove from bed and slide behind the head of bed.

Wash rubber draw sheet with soap and water. Dry and suspend over back of chair. Cleanse rubber pillow covers in the same way, if in use.

Brush the remaining mattress as the first one; remove from bed and place beside the other.

Brush pillows and place over mattresses.

Use fine sand soap or soap powder for stains on the bedstead.

Wash the bedside chair and table and put fresh paper in drawer. If a bureau, the drawers receive the same attention.

Carry utensils to lavatory. Dispose of materials as instructed in the disinfection of beds, omitting the sterilization. (See page 74.)

Scrub hands and return to ward. If a room, see that it is aired and make up the bed.

Special observations

Inspect mattresses. If tufts are missing and if hollowed, tag "to be repaired" and send to mattress room. Replace with fresh mattresses.

For blood-stained pillows and mattresses make a paste of raw starch and salt solution, or chlorinated soda solution 1–200, and cover the stains. When dry brush off and repeat the treatment if necessary; otherwise scrub with tepid water. The chlorinated soda solution will bleach out the color of the ticking.

Vaseline and oil stains may be removed with benzine.

For ink stain wash the article in soap and water, boil, and when dry apply oxalic acid solution or salts of lemon, and place in the sun.

Inspect the rubber draw sheet for perforation. Inspect the seams of the pillows for feather leakages, and repair at once.

See that nothing is left by the previous occupant.

XII

TERMINAL DISINFECTION OF FURNITURE AND EQUIPMENT

Purpose

For cleanliness and as a safety measure against the spread of disease.

Occasions

Following the discharge of a patient who has been ill with a communicable disease common to those admitted in a general hospital, or who has been on special precautions on a ward or isolated in a room.

Following the transfer of a patient to a contagious hospital who, while in the hospital, has developed an acute infectious disease secondary to his first disease, which may be smallpox, scarlet fever, measles, or diphtheria.

Equipment

rubber table cover
newspapers
precaution gown
2 clean precaution laundry bags
special whisk broom
precaution tags inscribed as follows:
Patient's name, ward, disease, date, nurse's signature on reverse side

In case of death add "Allen Street House," the mortuary

basin with 8 ounces of 2% formalin solution

enameled pail with one-half gallon of 1–600 of a 2% sylpho-nathol or lysol solution made with hot soft-soap suds

washed gauze sponge

rubber gloves are used in cases of spore-producing diseases, as anthrax, gas bacillus, etc.

Place rubber cover on bedside table, and arrange materials in order.

Procedures of disinfection

Mattresses and rubber sheet

Put on the precaution gown. Tag laundry bags, and place on clean newspaper on the floor. Newspapers may be spread also upon the floor about the field of operation. Strip bed, place linen in one bag, and blankets in the other. Attach tags to brass rings on pillows and mattresses. Place card rack and chart holder on table.

Dip the whisk broom into the formalin solution, and evenly sprinkle the mattress. Brush the surface about the tufts, corners, and sides thoroughly. Reverse the mattress and repeat the process. Remove and stand on its side at the head of the bed.

Fold the rubber sheet in two and place over remaining mattress. Dip the whisk broom into the formalin solution. Sprinkle and brush surface of the sheet. Fold the sheet over end on end so that the disinfected surfaces are brought together. When the sheet is reduced to a small folded square it is taken in the hand, and the last side

which came in contact with the mattress is sprinkled and brushed. The rubber sheet is refolded, the opposite side done in the same order, then wrapped in a clean newspaper and placed over the back of a chair until ready to be washed. The formalin is active meantime. Rubber cases are done in the same manner.

Dampen and brush the second mattress in the same way as the first, and remove from the bed and place beside the first one.

Pillows

The pillows are placed on the bedstead and their exposed surfaces sprinkled with formalin solution, and brushed. Before turning the pillows over to disinfect the second side, a clean newspaper is spread on the slats to receive them and prevent contact of disinfected surfaces of pillows with infected bedstead. When done, place the pillows on top of the mattresses. They are now ready to be transferred with the mattresses, to be either hung in the mattress room, sunned and aired, or transferred to the mattress sterilizing room where they are sterilized in autoclave, the treatment depending upon the virulence of the infection. In transportation the bedding is covered with a clean sheet and the orderly wears a gown.

Walls, woodwork, bedstead

The cleaning of a room is done by the hospital house cleaner under supervision.

If the patient has been one who could be kept on an open ward, as a case of pneumonia, typhoid, or a venereal case, the wall about the bed should be cleansed with the solution of sylpho nathol, and especially, if a corner bed, the wall in contact with the side of the bed.

The bedstead, table, and chair are moved to center of room. The walls and woodwork are washed with hot, soft, soap suds, not omitting the outside of the room door. Stains should be removed with soap powder, and ventilator wiped out. Window shades wiped off on both sides with damp cloth. Window and transom panes and sashes washed with fine sand soap. Electric push button should be disinfected. (Avoid getting moisture behind button.)

The bedstead is washed with gauze sponge quite wet with the sylpho-nathol solution. All surfaces and every crack and crevice should be soaked with the solution. The bed is gone over a second time with the sponge wrung out dry. Stains are removed with sand soap. The chart holder and card rack are washed with the same solution, dried, and hung on the bed.

Clean newspapers are spread on the bed. The rubber sheet is spread over the newspapers and thoroughly washed with soapy sylpho-nathol solution, in the same order as when brushed and sprinkled with the formalin solution. It is then hung over the head of the bed to dry and air.

Bedside furniture

All surfaces of the bedside chair are gone over, special attention being given to under part of feet. A clean newspaper is placed on the seat of the chair, and the articles from the table are transferred to it. The rubber cover from the stand is disinfected on both sides, and placed on the bedstead to dry. All surfaces of the bedside table are washed, including the drawer and drawer space. As nothing of any value is kept in the drawer, all articles which may be sterilized or burned are temporarily wrapped in clean paper. The drawer is placed at an open

window to air, in the sun if possible. Special attention should be given to the parts handled by the patient, and to the under part of the feet where dust pads form.

Floor

The floor is scrubbed, oiled, and polished after disinfection of the furniture.

The room is left to air for 24 hours.

After care of equipment

Materials used for disinfection are carried to the lavatory and placed on clean newspapers. Left-over solutions are emptied into the hopper. The gauze sponge is pulled apart and placed in the gauze pail. The soiled newspapers are wrapped and tied in a clean one, and placed in dust pail to be burned. The whisk broom is washed in hot suds, and hung up to dry and air. The solution pail is sterilized by boiling for ten minutes, dried, and put away.

After care of articles used by patient

Ice cap and hot water bags are washed with sylphonathol solution, sunned and aired for a day.

The clinical thermometer is soaked for thirty minutes in 2% formalin solution, washed and dried.

Urinals and bedpans, douche pails and pans are sterilized by steam for ten minutes.

Cutlery and dishes are boiled in a large dishpan or sterilized in the dish sterilizer.

Personal disinfection

Rubber gloves, when worn, are removed and placed in a basin of soapy solution. They are washed inside and out with hot, soapy water, wrapped securely in gauze,

placed in boiling water and sterilized for five minutes. Remove, dry, and powder thoroughly inside and out; match and put away wrapped in a clean, not sterile, dressing towel.

Remove gown and place in a special bag. Soak hands in disinfectant (corrosive sublimate 1–2000) at least two minutes by the clock. Scrub hands, nails, and arms, preferably with yellow soap, in agate basin with special brush for five minutes. Empty water into hopper, and sterilize basin. In the absence of a utensil sterilizer, sterilize basin and nail brush for ten minutes by filling with water and boiling over gas burner.

Sterilization of bedding

After the following diseases—anthrax, erysipelas, measles, scarlet fever, smallpox, gas bacillus infection—hair mattresses, pillows, and rubber sheets are sent to the sterilizing room. Bed linen and blankets also are sent to the sterilizing room before going to the laundry.

XIII

BEDSORES AND PRESSURE SORES

A fully developed bedsore or pressure sore is a local gangrenous lesion involving the skin and underlying tissues. The chief cause is the constant pressure of an opposing surface against one or more parts of the body, which cuts off the blood, lymph, and nerve supply of the skin.

Chief contributing causes

Physical condition of the patient. Cases of lowered vitality, poor circulation, and wasting diseases.

Continuous positions, either prescribed, as for fractures or drainage; or persistently assumed by the patient for relief from discomfort.

Appliances, worn for support of injuries, or correction of deformities.

Irritating substances in contact with the skin, as bodily discharges; or chemical agents, as iodine.

Possible causes

Abrasions. These injuries to the skin are apt to be unobserved complications at the time of an accident, frequently about the sacrum. They may become infected. There should be immediate protection of the broken skin against infection and removal of pressure.

Chafing. Chafing is frequently due to contact with the bedding or of two opposing surfaces of skin. Lubricate and protect skin.

Furunculosis. This infection may be due to uncleanness and moisture, or to some predisposing condition that has lowered the patient's resistance, as typhoid fever. Bathe thoroughly and keep the skin dry.

Points of development

These are learned best from study of the skeleton. Daily observation should be made of all bony prominences; for example, the occipital protuberance, especially in babies; tips of the ears and shoulders; elbows, on which the patient propels himself; the spine especially, including sacrum and coccyx; the hip bones, ankles, and the heels. These parts of the body have very little subcutaneous fat and are very sensitive to pressure.

Early signs and progressive development

A dark red spot may appear over a prominence, usually the sacrum, because of the weight which it carries. If immediate steps are taken for relief of the pressure the normal condition of the skin may be restored; otherwise, if neglected, in one day the skin at that point may assume a dark, purplish tinge, and the area about this discoloration will be indurated. Later, gangrene or death of the part takes place and will extend beyond the area of pressure with a resulting separation of the dead and living tissues called sloughing. Skin destruction may require grafting to repair defects; the sacral canal may be involved and lead to meningitis.

Owing to the putrefying nature of the sore, and the lowered resistance of the patient against infection, sufficient toxins may be absorbed by the body cells to change the picture of a bedsore to that of a fatal case of general septicemia.

Observation of a new patient

If a bed patient before entering the hospital, observations should be made while giving the bed bath, and the following conditions be reported: red and tender areas over bony prominences, abrasions, chafing, furunculosis, signs of recent application of plasters or blistering agents, and active bedsores. Bedsores are seldom found except on those patients who are admitted to the hospital having suffered from lack of nursing care.

Daily care and preventive measures

The essentials of daily care are an even, firm mattress; cleanliness of body and bed; dry, unwrinkled sheet and nightgown; frequent change of position at regular intervals by the clock, or such as the patient's condition will permit; frequent rub with bathing solution followed by powder; for reddened area inunctions of castor oil or zinc oxide ointment; removal of pressure by means of small pillows, pads, and rubber appliances.

With patients wearing corrective appliances, undue pressure at some one spot may be brought to the nurse's attention following the application of a splint or plaster cast. This matter should be reported to the proper authorities. If a splint, it is usually readjusted; if a plaster cast, an opening may be made over the point of

pressure. Powder may be puffed under the edges of casts to relieve irritation between the edges and the patient's skin.

Incontinent patients

Because of the constant irritation from discharges, vigilance on the part of the nurse will be required. To protect the bed, large picked cotton and oakum pads may be used with a paraffin paper or newspaper foundation. A supply of these pads should be on hand to avoid delay in changing. Such patients need frequent washing and careful drying with a soft towel or gauze. The skin should be freely covered with castor oil, zinc-oxide ointment, lanolin, or rendered mutton fat to make it waterproof. A small enema is sometimes ordered every other day to clear out the lower bowel.

In changing the bedclothing, wet or damp sheets should be removed with care and not be dragged or pulled from under the sodden and tender skin, because there is danger of abrading it.

TREATMENT OF BEDSORES

Treatment is directed to promote and improve the circulation of the part affected. More damage must be prevented and the damage already done must be remedied.

In order to get results from any treatment, removal of pressure on the affected part must be obtained, the sore must be protected, and the skin about the broken down area be kept dry, clean, and massaged.

In changing dressings use olive or cottonseed oil to cleanse the skin before applying the fresh dressing.

Method I

zinc oxide } of each
castor oil } one ounce
balsam of Peru, one-half ounce

These should be blended, spread thickly on a sterile sponge and also about the sore. Apply the sponge to the sore and cover with a sterile pad held in place with narrow strips of adhesive tape. If the sore is at the end of the spine apply a T binder over the pad.

Method II

zinc oxide ointment
aristol
tincture of myrrh 1–8, diluted one-half
sterile sponges
spatula
cottonseed oil
adhesive tape

Sponge the sore and edges with warm tincture of myrrh and sprinkle aristol powder over the sore. Spread oxide of zinc ointment thickly on a sterile gauze sponge; over that sprinkle aristol powder and apply over sore. Hold in place with adhesive tape.

Sloughing bedsores

Bedsores vary in degree of severity according to the circumstances which surround their development. The most serious are those in the advanced stage of deep sloughing without any tendency to repair. To the patient with lowered resistance this affords a starting point

for a local and general septicemia. Such patients need the best of nursing care, cleanliness, liberal diet, forced fluids, attention to bowels, fresh air and sunshine.

Outside of surgical intervention the following methods may be prescribed: flaxseed poultices for a limited period, to clean the sore; application of sterile gauze pads wrung out of hot antiseptic solutions, as chlorinated-soda, 1–200; boric solution, 2%; di-chloramin T; exposure to air and sun; exposure to electric light.

Di-chloramin T

The skin surrounding the sore is protected with zinc oxide ointment or ambrine, as the di-chloramin T is irritating.

The di-chloramin T is applied directly to the area denuded of skin with an atomizer or medicine dropper, or it is directed on the sterile gauze to be placed over the sore.

The whole area is then covered by a dressing of sterile gauze secured with adhesive tape.

Open air treatment

Remove dressing, cleanse sore and expose to air and sunshine, if possible, for several hours a day. A surgical cradle is placed over the exposed area and a piece of surgical gauze or cheese cloth is stretched tightly over the cradle and secured to the bed for protection of the sore from dust and flies.

Electric light treatment

An electric bulb is hung from a cradle near the sore. An agate basin is inverted over the bulb to protect the bedclothing. This treatment, which requires close supervision, is applied in 2 and 3-hour periods, according to the depth of the lesion.

XIV

BED BATH AND GENERAL TOILET

Time

The best time for giving a bath is before breakfast, or about an hour after. The patient should receive a full bath daily if his condition permits.

When patients do not receive a daily bath they should have arm spaces washed and "local" bathing done.

Equipment

2 gray blankets
rubber table cover
patient's towel
wash cloth
washed gauze
nightgown
bathing solution
powder
soap and nail brush
scissors
orange wood stick
tooth brush[1]
foot tub
hot water bag if needed

Preparation and procedure

Carry equipment to the bedside in the empty foot tub. Place the rubber cover on the table, and on that arrange equipment in order. Carry empty tub back to lavatory and prepare water at temperature 108°–110° by bath thermometer. Tub should be one-third full.

Close nearby windows. If an open ward, screen the bed thoroughly; if a room, close the door.

[1] For care of mouth, see page 29.

Application of first blanket

Turn down the upper bedclothing to waist line, double the first gray blanket end to end, and place over the patient with the open ends towards the head. Tuck the under edge over the patient's shoulders. Reach under the blanket and draw down the turned back fold of the upper bedclothing to the foot of the bed, which leaves the upper bedclothing folded halfway down from the foot of the bed. Draw down the upper edge of the gray blanket with the remaining half of the bedclothing to the foot of the bed. In order to clear the patient's feet an extra fold of the bedclothing is then turned upon itself, making in all three folds at the foot of the bed.

Application of second blanket

Turn the patient to the opposite side of the bed. If a hospital gown, unbutton while the patient is on the side. The blanket is folded in two lengthwise and placed in the bed, with the fold towards the patient, and as high as the patient's neck. The upper half is gathered and pushed under the patient's feet, the remainder tucked against the patient's back. The patient is now rolled over facing the nurse, and the remainder of the blanket pulled through behind and smoothed out. The patient is turned on his back and nightgown is removed.

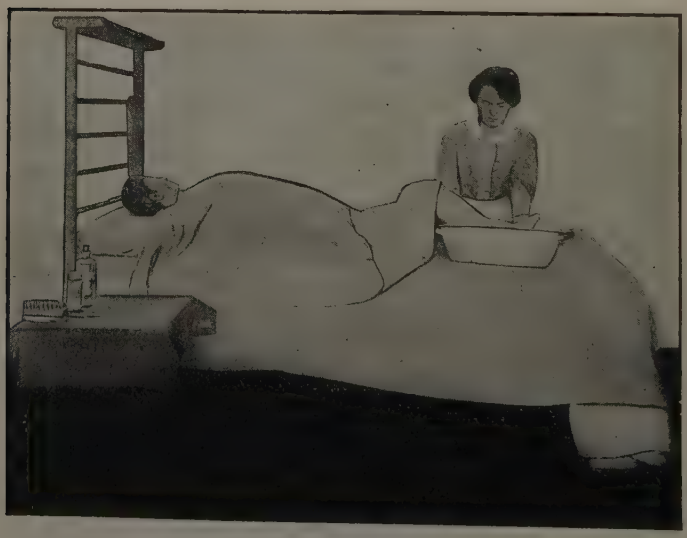
Bathing the patient

Spread the towel under the patient's chin. Bathe the eyes with clear water. Use a different part of the wash cloth for each eye. Dry gently. Use a limited amount of soap in washing the face, while for the remainder of the bath soap may be used more freely. The routine of washing each part of the patient's body with the soapy wash

cloth, rinsing off the soap, and drying with the towel is carried on throughout the bath.

The order in giving the bath should be the following: First, bathe the eyes, then the face, neck, arms (using the nail brush on the hands), chest, shoulders, and arm spaces, powdering the spaces after thorough drying. Next, the abdomen and surrounding parts, including the umbilicus, which may call for special attention in giving the so-called "admission" bath. Extraneous material may be removed by tooth picks with their points covered carefully with absorbent cotton and dipped in a warm, soapy solution, or olive oil, before using.

The thighs and knees are done next, reaching under the blanket, starting with the farther thigh. Each foot is



NURSE GIVING PATIENT A BED BATH

placed in the tub separately and bathed in the following manner: Turn back the corner of the upper blanket over the patient's leg as far as the knee. Cross that leg over the opposite one out of the way to make room for the tub, which is placed lengthwise at the foot of the bed. The patient's leg and foot are supported with both hands and lifted into the tub. The upper blanket is snugly tucked about the thigh to prevent exposure. The leg is washed and foot is scrubbed with the nail brush. The towel is spread out on the side opposite the tub, ready to receive the patient's foot, which is now lifted out of the water, partially dried with the wash cloth, and wrapped in the towel. The tub is placed on the table and the patient's foot is moved into position, dried, and covered with the upper blanket. The same procedure is carried out with the second leg and foot.

The water is changed for the completion of the bath. The patient is now turned for the first time, and the back is bathed from the neck to the waist line, finishing with the sacrum and buttocks. Finally the whole surface of the back is briskly rubbed with bathing solution, and powdered.

Removal of under blanket

While the patient is on his side, the under blanket is gathered in folds against his back, the lower part pushed under the feet. The patient is rolled over towards the nurse and the blanket removed. The clean nightgown, if a closed one, is gathered up in the back and slipped over the patient's head and the hands drawn through the sleeves. If an open gown it is put on as usual.

Local bathing

As a rule a patient prefers to attend to washing between the thighs, if able, but the nurse should assume the responsibility, as it is an important part of the bath. Gather the nightgown up about the waist line. Wash the parts with several pieces of wet, soapy gauze and finish with dry gauze. In some conditions it may be necessary to place the patient on a bed pan or douche pan to do this washing; if so, pour warm, soapy water over the parts, dry thoroughly with washed gauze, remove the bed pan, and pull the nightgown down as far as it will reach.

Final toilet

The finger nails are now manicured, using scissors and not too sharply pointed orangewood stick. Spread out a towel to catch the nail clippings. The finger nails are rounded evenly with the tips of the fingers, and the cuticle at the root of the nails slightly retracted with the blunt end of the orangewood stick.

In cutting the toe nails it is not well to clip off the corners of the great toe nails. Callosities of the soles of the feet are usually treated with prolonged soaking. (See Foot Baths, page 104.)

Completion of the bath

Draw up the gray blanket and bedclothing together as far as the patient's chin. Fold back the bedclothing to the patient's waist line and remove the blanket. If the bed has been made previous to giving the bath the bedding is neatly adjusted, and the bedside put in order.

The bath is at once recorded in red ink in its special space on the bath chart. The soap and dish go in the

table drawer. The bath equipment is carried out and disposed of in the following order: The bath water is emptied into the hopper, the tub is scrubbed with soapy water, rinsed, dried, and hung up. The folded blankets are put in the linen closet. The washed gauze is put in the gauze pail. The nail brush and orangewood stick are rinsed in hot water and sterilized. The towel is placed in the laundry bag, and the bathing solution and powder are returned to their respective places.

Care of the patient's hair

If the patient's hair has not been combed earlier in the morning it is done now.

For a woman, place an open towel lengthwise at the side of the patient's head and extend over the shoulder. Place the braid of hair upon the towel and separate. If the scalp is sensitive the nurse may grasp the hair midway between the head and end of hair and twist it once about the index finger of one hand, while she combs from the ends up. She then releases the hair and combs from the scalp down. The hair is rebraided in front of the ears, and the ends securely fastened with a small, narrow, rubber band. If the braids are not too heavy they may be crossed at the back of the patient's neck and held in place on the top of the head with a hair pin.

A patient taking his own bath in bed

When a patient can take his own bath he should be provided with blankets and everything else necessary. The nearby windows should be closed. The nurse should wash the patient's back and feet. Protect the back with a shoulder blanket. See that the patient is clean after the bath.

Special care of patients

In cases where the nurse has time at her disposal, when giving a bath it is well to use an extra basin of plain warm water in which to rinse the wash cloth, or in which to keep an extra sponge or wash cloth. A sea sponge should be rinsed in clear water and squeezed dry, never forcibly wrung because of the danger of tearing it. Hang up in a mesh bag to dry in the air and sunshine.

Separate wash cloths or sponges may be used for face and body. The same rule holds good in regard to the use of towels and soap. It is well to learn about the patient's personal habits in regard to the toilet.

In the place of blankets a large Turkish towel may be used. The former are preferable, however, even if made of cotton, as they afford better protection.

If giving a bath in a cold room, the towel may be placed on a hot water bag between the intervals of washing and drying the body. Another bag should be kept at the feet.

If using alcohol for the final rub, warm by uncorking the bottle and placing in a utensil of hot water. Guard against using freshly laundered bed garments and linen before airing.

A tub bath

If the patient can take a tub bath have everything ready on a chair or table in the bathroom. Fill the tub half-full at a temperature of 104° F. Spread a newspaper or folded gray blanket on the floor and render any other assistance necessary. Give as much privacy as possible.

XV

INFANTS' BATH

Equipment

Toilet tray

jar of sterile cotton swabs
jar sterile balls of cotton
safety pins, large and small
loose absorbent cotton
dish of 2% boric solution, lukewarm
dish of cottonseed or other pure oil
zinc stearate powder
shaker of castile soap powder
bottle albolene, medicine dropper in place of a cork
pair blunt scissors
fine tooth comb and brush

Clothes rack

blanket
shirt
folded diaper
petticoat and dress, one fitted within the other
stockings or bootees when worn

On table

nurse's rubber and cotton aprons
large soft towel
soft face cloth or gauze
small bath blanket
large paper bag
bath thermometer
basin

Preparation

During cold weather or in a drafty room it is preferable to bathe an infant before an open fire or radiator. The temperature of the room should be 75°–80°. Bathe quickly and deftly with as little waste of the baby's body heat and energy as possible. Bathe before feeding hour, never directly after.

Open paper bag and place on the floor by table. Put on the rubber and cotton aprons. Fill the basin with water 98°–100° F. Place baby on your lap face down on open bath blanket. Unpin all clothes, turn on back, loosen clothes and remove over feet, never over the head. Put soiled clothes on one side of the rack, wrap baby in bath blanket, and weigh him without clothes each morning.

Procedure

Eyes

Dip cotton ball in dish of boric solution, not getting fingers into cup. Hold ball with finger tips and squeeze lightly. Place left hand on head with thumb on cheek bone, pulling downward, and stroke across eye with cotton once from nose toward ear. Repeat this until eye is clean and well flushed with solution. Go over eye but once with each piece. Dry lids gently with dry cotton.

Nose

Cotton swabs are used, dipped in boric solution or albolene. Clean carefully.

Mouth

Do not clean mouth without doctor's order. It is not needed in a healthy condition.

Ears

Do not touch unless they appear soiled. Then clean out carefully with cotton swabs and water, and dry with clean swab. Place all swabs, etc., in paper bag after use.

Face

Wash rest of face with clear water, being careful not to touch eyes or mouth. Pat dry, do not rub.

Head

Add sprinkle of soap powder to bath with hand, soap head and then wash off with cloth and water. If any "cradle cap," apply albolene, followed in a few hours by a castile shampoo. Rub lightly until head is dry.

Hands and arms

Soap and rub with the hand. Rinse off with cloth. Be sure to get all lint from about fingers and axilla. Dry by patting. Keep nails short. Cut straight across, covering the baby's eyes when cutting them.

Neck, chest, abdomen, and legs

Proceed as with arms, paying special attention to the umbilicus, if cord is being dressed.

Back

Turn on stomach. Wash back as arms, finishing by rubbing briskly with hand to stimulate circulation and rest baby.

Buttocks

Wash with absorbent cotton; oil or powder may be used, depending on the condition of the skin.

Turn baby on back.

Vulva

Wash vulva gently with cotton, separate and get into all creases. Oil.

Penis

Clean with cotton and oil. Remove any lint.

Notes

Heat rash may be powdered lightly. Thin, premature, and incubator babies are bathed with warm oil instead of with water. Oil will clean almost as well as water, but not so well as soap and water.

When the eyes, ears, and nose are done first, sometimes the baby will cry throughout the bath as a result of these disagreeable procedures, which should be carried out with the utmost gentleness consistent with thoroughness. In such cases they may be left until last, when the bath itself may be enjoyed.

Tub bath

In giving a tub bath the temperature of the water is usually 98°, at six months, 95°.

The eyes and ears are first done in the usual way, then the infant's head is directed over the tub, supported with the nurse's left hand, while with the other she gently lathers the scalp, rinses off the soap and pats the head dry.

The arms, thigh spaces, and folds of the skin are next lathered, then the infant is lowered into the tub with the back of its head and shoulders supported in the firm grasp of the nurse's hand, with one of her fingers extended under the axillary space, while with the other she quickly rinses off the soap.

The infant is lifted out of the tub and enveloped in a soft blanket, and patted dry without exposure. Particular attention is paid to parts of the body where opposing surfaces come in contact. The genitalia are attended to following the drying process.

Dressing

Place baby on a dry clean blanket, face down on the lap. If he is wearing a band put that on first, otherwise lay shirt across shoulders and folded diaper across buttocks. Turn baby over on his back. Fasten shirt then diaper. Draw petticoat and dress together over feet and put arms through sleeves. Put on stockings, bootees, etc. Turn on face and fasten neck bands. Comb hair. Put blanket about shoulders and turn back. Fasten his blanket and finish his hair. If he is puny, undersized, or very sick, put in bed with hot water bottle at 115°, for at least one hour.

BATHS FOR OLDER CHILDREN

Children are usually bathed in the regular tub when possible. They have a full bath daily, including the head if the hair is short, and the routine is carried out as in the adult bath.

If a bed bath is given one large blanket is sufficient. The blanket is folded in two, one-half is slipped under the child, the remainder is brought over him, and the nurse bathes the patient between its folds.

XVI

PEDICULOSIS AND ITS TREATMENT

Pediculosis may be due to one or more of three types of pediculi:

Pediculus capitis, or head louse
Pediculus corporis or vestimentorum, or body louse
Pediculus pubis, pubic or crab louse
Each is a distinct species.

Preparation of the nurse in treating pediculosis

The nurse should wear an all-over apron with short sleeves. She should avoid touching her face and hair during the operation and as a safety measure should comb her head at the earliest opportunity with a fine tooth comb.

PEDICULOSIS CAPITIS

Symptoms

This species, which inhabits the head only, is discovered because of the persistent itching of the head, often with scratched and infected areas and enlarged lymph glands behind the ears or in the upper part of the neck.

Carbolic acid treatment

This treatment is effective in killing both lice and nits, but it does not remove nits from the hair. It is not injurious to the scalp.

Equipment

half sheet and rubber
rubber pillow case
rubber shampoo cape
two dressing towels
round agate basin
round agate pitcher
foot tub

Preparation and procedure

Apply rubber case to upper pillow. Protect bed with half sheet and rubber. Pin folded dressing towel around the patient's neck. Spread newspapers on the floor beside the bed and on them set the empty tub.

For patients with long hair put on the shampoo cape with its end directed into the tub to act as a trough. Place the basin in the tub so that it will catch the carbolic solution. Turn the patient on the side with the back of the head directed over the edge of the bed above the tub, and with the hair hanging on the trough of the cape.

Protect the patient's eyes with the folded dressing towel. If necessary, plug the upper ear loosely with a pledget of absorbent cotton.

Prepare a 1–40 solution of carbolic acid by pouring into the pitcher one pint of 1–20 solution of carbolic acid; add one pint of hot water and mix thoroughly. With the mouth of the pitcher directed toward the back of the patient's head, pour the warm solution over the hair. Turn the solution back from basin to pitcher,

TOWEL CAP

and pour over the head about three times, until it is thoroughly saturated. Allow the hair to drip for a few seconds, or longer if it is very thick, before tying it up in the improvised towel cap. For children under three the hair should remain tied up one-half hour; for children from three to twelve, one hour; for adults, two hours.

At end of allotted time, move half sheet and rubber and place under the patient's head. Shake out the hair and let it dry. A shampoo is not necessary. When the hair is dry the dead lice can be combed out with a fine tooth comb.

Care of the cap and other materials

On removal of the cap place towel in a basin of hot water and boil for ten minutes. Wash out the towel, shake over the hopper, dry and place in special laundry bag. The half sheet is placed in a pail and boiling water poured over it. It is then disposed of in the same manner as the towel. The chair is wiped with a damp cloth and the newspapers are carefully rolled up, tied in a clean newspaper and burned.

To remove nits

Smear the hair well with the following ointment:

acidii salicylici
sulphuris præcipitati } one-half dram each
petrolati, one ounce

Tie the hair up in a towel. Let it remain tied up over night. Wash hair in the morning with a very hot soap and water solution. Rinse with hot water and while the hair is wet comb carefully with a very fine comb. Repeat this process every other night until hair is free from nits.

PEDICULOSIS CORPORIS

The adults live in the clothing, especially in the seams of the underclothes, feeding on the skin.

Symptoms

Itching, minute hemorrhagic spots on the skin. Bites on the skin are characteristic. Adults can usually be found by careful search of clothes.

Treatment

Hot bath to remove adults from body. Shave if any ovum or eggs are found adherent to body hair. This is usually sufficient, but may be followed by application of the ointment prescribed for treatment of the head.

Most important is treatment of clothing. That worn next to the body, if cotton, should be boiled twenty minutes, other clothing steam sterilized. In the absence of a sterilizer the clothing should be ironed twice with a hot iron, paying especial attention to the seams. If a sterilizer is used, one thorough treatment is sufficient.

PEDICULOSIS PUBIS

Symptoms

Local itching above pubis and about genitalia. Careful search usually shows adults adherent to pubic hair and eggs laid at base of hair.

Treatment

Thorough washing with soap and hot water followed by application of the ointment. Shaving the pubic hair is more certain to cure. In the place of shaving a fine tooth comb may be effective.

XVII

CARE OF HEAD AND HANDS OF MALE PATIENT

Equipment

half sheet and rubber	scissors
patient's towel	bathing solution
wash cloth	soap
nail brush	basin of warm water
orangewood stick	rubber table cover

Pediculosis

Observe head for vermin and if present treat as in previous chapter. If an infested beard, it should be shaved, but never without an official order. If vermin are on eyelashes they will be found at extreme root and should be removed by forceps, as anti-vermin treatment may be dangerous to the eyes. But a 1% cream of yellow oxide of mercury may be used.

In treating such patients the nurse should wear a long gown over uniform.

Washing the head

Slip rubber case on pillow. Place half sheet and rubber over pillow under patient's head. Unbutton the neck band of shirt and pull forward to prevent wetting. Spread towel under patient's chin ready to use.

Apply soapy water over entire head with wash cloth. Follow by a thorough scrubbing with nail brush. In order

to get at roots of hair, if of any length, separate with thumb and finger of one hand as brush is used with other.

Wring out wash cloth and wipe off soap suds. If possible, hold patient's head over basin and rinse with clear tepid water. Apply bathing solution on hair, rub into scalp, dry thoroughly with towel, and comb later. If patient has a beard, the same treatment is carried out.

Care of hands

Place half sheet and rubber under patient's hands on near side of bed. On the rubber place basin of hot water and soap dish, in the basin a nail brush and wash cloth. Soak hand in basin and scrub briskly with brush about the nails. Dry with wash cloth, then with towel. Clean and trim finger nails, never too short.

Treatment of calloused hands

Soak for an hour or more in hot, soapy water to which have been added a few drops of ammonia or a quarter of a teaspoon of sal soda. After soaking, dry hands and rub vaseline into palms. Use pumice stone to remove thickened skin. Vaseline and soap poultices may also be used in extreme cases. In any treatment when vaseline is used, the bedding should be protected.

To remove stains

To remove machine grease, any sand soap, kerosene or benzine may be used; for paint, use turpentine or kerosene. For discolored finger nails, acetic acid 1–16 may be used, or peroxide of hydrogen.

XVIII

SHAMPOO OF WOMAN PATIENT

Equipment

half sheet and two rubber protectors
rubber pillow case
rubber shampoo cape
2 patient's towels
wash cloth
dressing towel
agate basin
safety pins
comb
bathing solution
soapy water, 110°
agate pitchers for
  first rinsing water, 100°
  second rinsing water, 80° or less
foot tub
newspapers

Carry equipment to bedside in foot tub. Spread rubber cover over bedside table and arrange equipment in order. Spread newspapers on the floor beside the bed and on them place the empty tub. Bring in the pitchers of water.

Preparation of patient

Close nearby windows. Slip the top pillow into the rubber case. Replace under the head with a slant towards the edge of the bed. Fold the dressing towel about the

patient's neck, cross in front and pin. Turn the patient with her back towards the nurse. Slip the half sheet and rubber under the lower pillow and against the patient's back. The edges hang over the side of the bed so that the unprotected part of the mattress above the rubber draw sheet is covered. Fasten the rubber cape about the patient's neck with its end directed over the side of the bed and above the tub on the floor. Place one of the folded towels on the pillow between the patient's face and the cape for comfort. Comb the hair, then start washing.

Procedure

The wash cloth is put in the pitcher of soapy water, slightly wrung and wrapped about the first three fingers with the ends well in hand. Wash the scalp briskly from one temple to the other, meanwhile with the other hand separate the hair at its roots with the thumb and index finger. The remainder of the scalp is washed from the top of the head to the neck, using the comb to separate the hair at half-inch intervals so that no part may be overlooked. As the shampoo progresses the patient gradually turns over on her face. When the procedure is completed she is again turned on her side near the edge of the bed with her head projecting slightly over the edge above the tub on the floor, the hair hanging over the cape. The remainder of the soapy water is poured over the scalp and hair. The scalp is lathered and rubbed with the finger tips. The hanging hair is enveloped in the folded wash cloth and rubbed between the palms of both hands, sliding along its length.

Before rinsing, as much of the suds as is possible is squeezed out of the hair with the wash cloth. Rinse with

the water 100° F., manipulating the scalp at the same time to get out the soap, until the water runs clear. Use the pitcher of cooler water for the final rinsing, at 80° or less if the patient can bear it.

When the rinsing is completed, envelop the hair in the wash cloth, which has been rinsed, and squeeze along its length to remove the water. Avoid twisting or wringing. Remove the towel from the pillow and bind firmly about the hair to absorb the moisture, then give to the patient to hold until she is moved into position. Push the foot tub under the bed, remove the rubber cape and neck towel, readjust the pillows, and move the patient to the middle of the bed on her back. Remove the half sheet and rubber from the side of the bed and place under her head. Remove the towel, spread out the hair, sprinkle the bathing solution or hair tonic over the hair and rub into the scalp. With the second towel rub the scalp dry, separate the hair in strands, and rub between opposite surfaces of the towel. The hair is then spread out over the pillow. When dry, comb and braid. Finally remove half sheet and rubber pillow case.

Remarks

To guard against getting water into the ears plug the orifices with absorbent cotton.

In rinsing long hair which may hang into the water in the tub, an empty basin may be floated on the surface and the hair allowed to drain into the basin. Instead of pitchers for rinsing, a rubber douche bag may be used, to the tubing of which can be attached a metal perforated spray.

The hair may be spread over a hot water bag at 125° to hasten drying in cool weather.

After care of equipment

Roll up wet articles in the rubber table cover and tuck under arm. Place utensils in foot tub and carry all out together. Hang up damp and wet articles to dry. Wash foot tub and pitcher, dry and hang up. Put newspapers in dust pail and bathing solution in its place.

Shampoo of patient sitting in chair

Use a comfortable wooden chair and place a rubber cased pillow behind the patient's back. Get the patient ready in the usual way. Place the foot tub on a stool or chair behind the patient. See that the rubber cape hangs over the back of the chair above the tub. Wash and dry the hair. Remove the cape and neck cloth. Place the half sheet and rubber over the pillow at the back of the patient's neck and spread out the hair to dry. If possible move the patient into the sunshine or in cold weather near a warm radiator.

Snarled or matted hair

If a bed patient, protect the pillows with rubber cases. Rub and soak the hair with liquid petrolatum applied with a piece of gauze. Tie the head up in an old towel and do not disturb until next day. Remove towel, moisten one strand of hair at a time with alcohol, disentangle with the fingers, comb from the end carefully so as not to pull the hair, and braid each strand. Guard against overtiring the patient. In some cases only a little can be accomplished at a time. When the hair is thoroughly disentangled a shampoo is given.

In extreme conditions it may be necessary to cut out the matted sections of the hair, but this is not done without permission.

XIX

FOOT BATHS

CLEANSING FOOT BATH

Purpose

For cleanliness and comfort and for the treatment of corns, callouses, and thickened nails.

Equipment

gray blanket	bath thermometer
half sheet and rubber	hot water bag
patient's towel	foot tub
wash cloth and soap	nail brush

Procedure

Get the patient ready first. Loosen the upper bedclothing. Fold the spread up out of the way. Turn up the bedclothing even with the foot of the bed. Place a doubled gray blanket on the foot of the bed, tucking in just enough to hold it in place. Bring the upper bedclothing up with the blanket so it comes just below the knees. The blanket is released at the foot of the bed, and half sheet and rubber are placed under the feet.

The tub is half-filled with water at a temperature of 108°–110° by the thermometer and is carried to the bed. The feet are moved to the farther side of the bed and the blanket turned back on them. The tub is placed on the bed near the bend of the knees and is covered by the blanket. The nurse, with both hands under the blanket,

lifts the feet in so that the heels touch the water first. The feet are washed as in the bed bath, except that both feet are placed in the tub at once.

If the feet are to soak, the blanket is draped around the tub neatly, the surplus coming around the knees. A small pillow may be placed under them for comfort. The upper bedclothing is then brought over the tub to the foot of the bed, but the spread is left undisturbed.

At the end of fifteen minutes the water may be reheated to the first temperature by adding hot water. In doing this the feet are lifted well out toward the side of the tub and the water is poured in with the stream directed away from the feet.

When the bath is finished, the towel is spread under the blanket on the opposite side of the bed and the feet are lifted out and placed on the towel.

The tub is removed and the feet are given a brisk rub under the blanket, dried thoroughly, and the blanket removed.

MUSTARD FOOT BATH

Purpose

For local and general effect in relief of congested conditions or spasmodic pain; in such cases as head colds, acute bronchitis, asthma; in delayed or painful menses.

Equipment

Use the equipment for cleansing foot bath, omitting the nail brush, soap, and wash cloth, and adding the following:

small piece of muslin or gauze
mustard
tablespoon

Procedure

For an adult use two tablespoons of mustard to one gallon of water. Tie the mustard in the gauze so that no free particles will float in the water and burn the patient; place in the water and thoroughly dissolve. The water is brought to the bedside at 108°–110°.

The procedure is that for the cleansing foot bath.

A hot water bag at 125° is brought in with the tub. The bag is wrapped in the towel and placed in the bed beside the patient. The towel thus is warmed, ready to dry the patient's feet.

When the feet are put into the water the time is noted, since the mustard bath may last from twenty to thirty minutes.

When the bath is finished and the feet have been dried carefully between the toes to prevent irritation, the feet may be wrapped in a blanket and the hot water bag placed between its folds.

If the patient is sitting up in a chair for the foot bath he should be made as comfortable as possible in an easy chair with the tub on a low foot stool. A blanket is draped around the body and tub to keep in the heat.

XX

LOCAL APPLICATION OF DRY HEAT

Purpose

Dry heat is most commonly used for relief of pain and tension in inflamed areas; to hasten reaction and restore circulation; to promote comfort and induce sleep by its sedative effect.

Agents

It may be applied locally by means of a hot water bag, and by various substitutes; by electric pads; by baking and by ironing. A hot water bag furnishes a quick and convenient method of application.

HOW TO FILL AND APPLY A HOT WATER BAG

Equipment

hot water bag free from imperfections
flannel cover for bag
washed gauze
pitcher
bath thermometer
hot and cold water

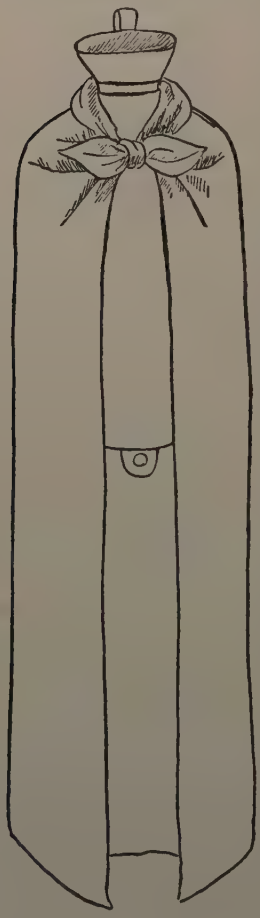
Procedure

Filling

Mix hot and cold water in pitcher and test with thermometer until it registers the standard temperature, 125°F.

for an adult, 115° for a child. Any temperature above these must not be used unless prescribed by the doctor.

Warm the bag with hot water, then empty. For ordinary purposes, *i.e.*, for the feet, the bag should be not more than three-quarters full. For application to the abdomen, or over tender or sensitive surfaces, one-half full should be sufficient. Following the filling of the bag, the air is expelled by grasping the neck of the bag in the left hand, and holding it bottom down on a solid surface, thereby pressing the water up to the neck, when the stopper is securely screwed in to prevent suction of air.



The neck of the bag is wiped dry with the gauze, and is then tested for leakages by turning upside down and shaking forcibly. If the bag has stood this test the neck should be perfectly dry. If the neck is wet either the stopper is not properly fitted, or there is a deficient washer or leakage in the bag itself. An imperfect bag should be discarded and tagged for repairs. Before applying to patient enclose the bag in its cover and tie securely.

In the absence of a cover one

may be improvised from a soft dressing towel or piece of flannel. Spread out the towel and place the water bag on it parallel with its length, the neck protruding over the hemmed end of the towel, which is drawn about the neck loosely, and tied in a knot. The selvage edges of the towel are folded over the sides of the bag, and the surplus end of the towel is carried over the stopper, and the corners crossed on themselves. They are then tied about the neck so that the bag is wholly covered.

Application

If applying hot water bag to the patient's feet, place it crosswise.

In warming an empty bed for the reception of a patient, it is permissible to have the water hotter than when the bag is applied to a patient.

In maintaining the heat in hot wet packs and poultices with hot water bags guard against the great danger of burning the patient because of the penetrating quality of moist heat. A dry blanket should intervene between the moist surface of pack or poultice and the bag, and close supervision should be kept.

Under no conditions should a nurse apply a hot water bag to the right lower quadrant of the abdomen on her own responsibility. Acute pain in that region may indicate an abscess of the appendix which might be ruptured by the application of heat.

Caution and good judgment must be exercised in the application of any form of heat to an unconscious or paralyzed patient, to aged persons and infants, or in any case in which sensation is dull, as in surgical shock.

The majority of serious accidents in nursing are due to the careless use of hot water bags. Burns occasioned by agents of heat are usually of second and third degrees. While in a sense localized, they are similar to bedsores and are deep and difficult to heal because of the destruction of the underlying tissues which nourish the skin. They are open to infection, augmenting the suffering and retarding the recovery of the patient, also involving the loss of confidence in the nurse, and if the patient is burned in a hospital, involving the reputation of the institution and of those in authority.

After care of hot water bag

Owing to the perishability of rubber, certain rules should be employed to prolong the use of water bags.

With proper care a bag should last at least four or five years. Empty and hang upside down to drain for fifteen minutes. Dry the grooved metal surfaces inside the neck of the bag; also the grooved metal stopper. This precaution will prevent the subsequent rusting and adhesion of the stopper to the neck of the bag. Inflate the bag, quickly apply the stopper, screw in, and hang up the bag. If not frequently used, powder and keep in a covered box.

Substitutes

Substitutes may be used in the application of dry heat. Anything that will hold heat may be used, such as

heated plates, flatirons, soapstones, wrapped in flannel or old blanket; hot salt or sand applied in a woolen sock or stocking; or stone bottles filled with hot water and securely corked. Even baked potatoes and ears of corn rolled in the edge of the blanket which has been placed next to the patient have done good service in emergencies.

Electric pads

These are used in the same general way as hot water bags. They should be closely watched, owing to differences in currents and possibility of fire.

BAKING

For this form of treatment portable zinc ovens are used, fitted with electric bulbs and adapted to any part of the body. The oven has a wire and plug for electrical connection. Other ovens are lined with asbestos and heated by Bunsen burners.

These ovens are used as a means of applying dry heat in such cases as old fractures, arthritis, neuritis, myositis, bursitis, and for circulatory conditions, as Raynaud's disease and varicose veins of the leg.

Those for the arm and shoulder are made a little higher than those for the foot and leg.

The affected extremity is enveloped in several thicknesses of flannel, pieces of old blanket or turkish toweling as a protection against burning, and is thrust into the oven, except in cases when the bare shoulder is directly exposed to the heat. The temperature is controlled by turning on and off the electric current, or if the Bunsen burner is used, by raising or lowering the flame. The

treatment is continued until the skin is hyperemic, which may be from five minutes to one-half hour, depending on the nature of the disease. The after care is usually light massage of the part with an alcoholic mixture and in some cases a cold application.

IRONING

This treatment is frequently prescribed as a therapeutic measure for relief of pain in such cases as sacroiliac strain, lumbago, and sciatica. An ordinary electric flat-iron is generally used. One heated on a stove would serve nearly as well. The area to be heated is protected by several thicknesses of blanket or flannel; in the absence of either, a turkish towel would serve.

The iron is heated enough to produce a sense of extreme heat upon its application, but not enough to scorch the protective covering. The nurse irons up and down over the affected part with as much pressure as the patient can bear for ten to fifteen minutes, or until the skin is quite red. Blistering the skin must be avoided. This treatment is followed by the application of an analgesic preparation of menthol, olive oil, and alcohol. The ironing treatment is sometimes prescribed twice a day.

For Application of Moist Heat see Poulticing and Stuping.

XXI

LOCAL APPLICATION OF COLD

DRY COLD

Purpose

Cold is applied for the relief of headache in febrile conditions; to relieve pain and swelling of deep-seated congestion or inflammation; as an aid to blood-clotting in hemorrhages; for its sedative effect, especially in the tachycardia of hyperthyroidism.

Means of application

When regular caps or bags cannot be obtained, various improvised appliances may be used, such as a rubber douche bag, a bathing cap, a sponge bag, a rubber glove, rubber sheeting or oiled muslin bag, and for small surfaces, as the bridge of the nose, finger cots or rubber glove fingers.

Caution

In long-continued application of cold the area to which it is applied should be closely observed for irritation of the skin or frost bite. Cold cream may be applied and a few minutes of gentle massage given before each application of the ice cap.

In such cases the cap should have a dressing towel cover instead of gauze. If the skin is a deep red color the cap should be omitted for an hour or two. A frost bite is as serious an occurrence as a hot water bag burn, as there is arrest of circulation and destruction of tissue, resulting in a sloughing wound difficult to heal.

ICE CAPS OR BAGS

Equipment

ice cap or bag	canvas bag
ice	washed gauze cover
ice pick	tablespoon
wooden mallet	enameled basin

Preparation of ice

With the ice pick mark off the amount needed, apply the mallet to pick with short light taps, when the desired quantity will be separated with but little waste. The ice is then placed in the basin and broken into smaller pieces with the pick, ready to be crushed.

In the absence of an ice crusher fill the canvas bag one-third full of ice, place the bag against a solid surface and pound with the mallet. Shake the ice from time to time so that it may be broken more evenly. Break large sharp-edged pieces again, or hold under running hot water a second in a piece of gauze to melt off the sharp edges.

Filling and application of the cap

Sufficient ice should be used to cover the bottom of the ice cap fully. Much more gives unnecessary weight and requires suspension if the part is tender.

Express the air as in hot water bag. Then quickly screw the stopper down. Perfect flexibility proves the absence of air. The cap should then be examined for leakages in case of an impaired rubber washer.

Dry the cap and cover it with a square of doubled gauze or cheesecloth tied from opposite corners over the stopper. Then push down about its neck. The cover serves to absorb moisture and to guard against frost

bite. See that the whole surface of the cap lies upon the part to which it is applied. Avoid limiting the surface by tying the covering too tight.

If applied over the epigastrium, on a patient in the semi-recumbent position, the cap can be held in place by a loosely applied binder or a yard or more of 2-inch bandage attached to each loop of the cap. One bandage end may be carried under the arm and upward behind the patient's back to meet the second bandage over the opposite shoulder where it may be tied. In these cases a dressing towel is used to cover the bag.

Replenishing cap

As the object of an ice cap is the application of continuous cold, the contents should not be permitted to become slushy. When cap shows signs of ballooning, let out the air, pour off the water, and add more ice. The careful application and oversight of an ice cap is an index of good nursing.

After care of cap

When no longer needed, empty at once, wipe dry inside and out with washed gauze. Give special attention to the seams and grooved edges about the neck. Pack lightly with dry washed gauze. See that rubber washer is in place. Distend with air and apply stopper. If the bag is not in frequent use powder inside and out with talcum.

Note

In applying an ice bag over an outside dressing, a teaspoonful of coarse salt mixed with the ice will intensify the cold but cause the ice to melt more rapidly. If the

supply of ice is limited, place the cracked ice in a basin and mix with as much sawdust, flaxseed, or corn meal as the ice will take up, and a little more.

AURAL ICE CAP

This cap is usually ordered in cases of mastoiditis or earache. The hair about the mastoid process may be shaved. The ice should be about the size of lima beans.

Usually these bags are not covered. Tapes are attached to the four rubber loops. The kidney-shaped opening in the bag is slipped over the ear with its convexity towards the mastoid process. The upper and lower tapes are tied from opposite sides. The bag is small and needs frequent filling.

ICE COLLAR

The ice collar, as its shape and name imply, is especially adapted for the neck or to surround an extremity, and it may be applied to the hollow of the back in case of severe backache. In order that flexibility and comfort may be obtained the collar should not be more than two-thirds full. It is covered with doubled gauze or cheesecloth.

RUBBER SHEETING ICE BAG

Double a piece of rubber sheeting, about 16 by 24 inches, with the glazed side in, and fold again. The line of junction between the two doubled edges should be folded once upon itself and secured with two rows of fine sewing machine stitching. Leave an opening only large enough to introduce a dessert spoon, which may be used to fill the bag with ice. It should be broken evenly and mixed in a basin of sawdust or bran.

When the bag is filled two-thirds full the opening is folded over upon itself and firmly secured with a clothes pin or a strong paper clip. This sheeting may be made into bags to fit any part of the body.

ICE WATER COILS

This is a modified form of cold application used under the same conditions as an ice bag. It is sometimes used in preference for various reasons, such as, the coils are less heavy and less disturbing to the patient; the cold is more evenly distributed over the part to which they are applied; and temperature may be easily regulated.

Lieter coils are made of soft flexible metal tubes in sets to fit different parts of the body, *i.e.*, cap-shaped coils to fit the head, kidney-shaped to fit the ear and cover the mastoid process, and those made in greater diameter to fit the chest and abdomen. These coils have two open extremities to which rubber tubing may be attached to serve as an inlet and outlet for the circulating ice water.

Rubber coils are more flexible and can be homemade. To make one a little larger than an ice cap, use twenty-two feet of quarter-inch rubber tubing. Take five twenty-four-inch strips of tape about one inch wide. Beginning three feet from one end of the tubing, which later serves as an inlet for the water, the middle of the first piece of tape is wrapped around the tube and securely fastened by back-stitching with strong thread. The other four strips are similarly fastened to the tubing at intervals of one inch.

The tubing is now coiled in close fitting circles, and held in place between the folds of tape, which are stitched together between each coil. The last two feet of tubing is

left free to serve as an outlet. When completed the whole coil should measure 9–10 inches in diameter.

If greater stability is desired the tapes between the rubber tubing may be sewed to a piece of canton flannel.

Equipment for application to the abdomen

rubber table cover
double blanket
footstool or box 7-8 inches high
douche pail
large enameled pail
5-ounce funnel
glass U tube, or glass connecting tube
ice water coil
14-inch piece of rubber tubing
ice sufficient to lower temperature of water to 45° or 50° F.

Procedure

Put rubber case on pillow and rubber cover on table. Place footstool on table. Set empty pail on floor near head of bed to receive water.

Envelop a good-sized piece of ice in cheesecloth or gauze and place in an ordinary five-quart douche pail of cold water. Attach a glass connecting tube to the end of the rubber tubing, which in turn is attached to the ice water coil; the latter being in position on the patient. The douche pail should be 7-8 inches higher than the level of the mattress. Place the outlet tube of the coil in a slop jar or pail.

Open the catch which is attached to the rubber tubing leading from the douche pail and see that the water is

flowing into the pail. The top of the douche pail may be kept covered to save the ice. Guard against unnecessary exposure that not more of the patient's body than the coil will cover is left exposed.

The patient lies in the dorsal position. The upper bedclothing is folded back to the pubes, and the nightgown is doubled up from the waist line. Folded gauze is placed over the abdomen. Cover the chest and shoulders with double blanket and adjust the coil.

Should there be any trouble with the siphonage apply suction to the outlet tube with a syringe. The water should be regulated to flow slowly. In order to do so, the elevation of the ice water pail should not be more than 7–8 inches above the level of the mattress, when it will take about thirty minutes for one gallon of water to flow through the length of the coil.

This method of applying cold needs constant supervision, as the reservoir needs frequent replenishing with ice and water. In hot weather the pail may be covered and wrapped with paper.

As the pail on the floor fills it may be emptied back into the ice pail. A metal clamp or clothes pin will serve to shut off the water while the pail is being emptied.

In some cases a surgical cradle may be placed over the body and covered with a blanket, when sufficient space may be left between the edges of the two coverings for the exit of the two extremities of the tubing.

After care of coils

When the treatment is completed the rubber coils should be drained, washed with soap and water, dried and powdered, then put away in a towel in a tightly covered box.

Metal coils are cared for in the same way with the exception of powdering.

Notes

Head coils on a restless patient may be held in position by tapes attached to those which encircle the tubing and be tied under the chin.

If one continuous length of rubber tubing cannot be secured for the coil, glass connecting tubes may be used at either end.

MOIST COLD

In place of an ice cap, moist applications may be used.

For the head

Equipment

glass or agate basin
lump of ice
two half-yard pieces of gauze
bathing solution
rubber pillow case

Procedure

Place the ice in the basin.

Measure 2 ounces of bathing solution and pour over ice.

Fold each piece of gauze to fit the forehead, wring out of cold water and spread on ice.

Put on the rubber pillow case.

Brush the patient's hair out of the way.

Wring the compress out of the solution and apply in smooth folds over the forehead.

The two compresses are changed as often as necessary for comfort and relief.

Note: If cold moist compresses are to bind the head a thin rubber bathing cap may be used to keep the hair dry.

General application

The same methods may be carried out for other parts of the body, folding the compress to fit the part.

Eye compresses

Purpose

Usually ordered for the relief of conjunctivitis.

Equipment

dressing towel
rubber pillow case
eye bowl with perforated plate and ice
finger bowl with 2% boric solution
triangular-shaped pieces of gauze or absorbent cotton to fit over globe of eye
kidney basin or paper bag
pair forceps

In case of gonorrheal infection of eye, the following equipment is needed:

rubber gloves and apron
2 pairs forceps

A bowl over which a piece of gauze has been stretched will serve for drainage of ice.

Procedure

Slip on the rubber pillow case.

Adjust dressing towel about the neck.

Wring eye compresses out of boric solution and spread on the ice as many as the surface will hold.

Tip patient's head slightly in direction of affected eye to prevent solution running into other eye.

Place iced compress upon the eye and renew every other minute with a fresh one. Discard used ones into a paper bag and burn.

The nurse carries on the procedure with the use of forceps, one pair being kept clean for applying the compress to the affected eye, and the second pair used for removing the used compress and putting into the paper bag to be burned.

XXII

MISCELLANEOUS APPLIANCES

PICKED COTTON PADS

Picked cotton is made up of odds and ends of discarded cotton material, short bandage ends, scraps from the sewing room, small pieces of gauze and worn-out household supplies. This material is placed in an electrical picking machine which reduces it to a fine shredded fluffy mass, resembling cotton waste, which may be converted into surgical material and used for making pads and sponges. These pads when completed may be sterilized and used to reinforce dressings of discharging wounds.

Method of making

Cut off two-thirds of a yard of 36-inch gauze. Open the gauze and spread on its surface sufficient picked cotton to make a pad the desired size. The cotton is spread in thin layers and close enough to avoid open spaces so that the pad will be of uniform thickness, about ½-inch. Finish by bringing over from both sides the free selvage edges of the gauze, which should overlap firmly in the center. Four inches of gauze is allowed at each end for folding in. Size of pad when completed should be 10 x 14 inches.

SHEET WADDING PADS

Purpose

These are used for covering clean abdominal wounds, also for the application of hot antiseptic solutions and disinfectants.

Method of making

One double sheet of wadding will make three abdominal pads, or four of smaller size. Cut off about 20 inches of gauze, open and place the sheet wadding crosswise on the gauze. Fold the selvage edges of the gauze over each end of the wadding, which should overlap in the middle of the pad. The raw edges of the gauze are tucked in between the folds of the wadding at the sides. When completed these pads are rolled in compress cloth and sterilized.

OAKUM PADS

Oakum is tarred hemp rope which has been shredded.

Purpose

Oakum pads are used with incontinent patients for the protection of the bed linen.

Method of making

Take three or four sheets of newspaper. Fold the edge 1 inch on all sides. Cover the exposed surface of the newspaper with a thin layer of picked cotton; over that a thin layer of oakum, and over the oakum is distributed evenly another layer of picked cotton. The surface of the pad is covered with one thickness of washed gauze, which is turned in even with the folded

edges of the newspaper and basted on. Before discarding the pad after use, the gauze is ripped off and placed in the soiled gauze pail.

OAKUM RING

Purpose

This ring is used for the relief of pressure on heel or elbow.

Method of making

Mold sufficient oakum to form a large sausage or roll, about the size of a man's wrist and 12 inches long. Wrap the ends of the roll around the tips of the fingers of one hand. Remove from the fingers, place on a firm surface, and mold with both hands into a rounded compact cake. An opening is made in the middle with the fingers or a pair of pointed scissors, wide enough to permit the insertion of a cotton roller 1½ inches wide, which is wound about the ring until it is evenly covered; over this a finger bandage is evenly applied and finished by splicing it and tying the spliced ends together once, then around the border of the heel ring; otherwise the end may be caught under the turns of the bandage.

RUBBER AIR RING

Purpose

Rubber air rings may be used to support any part of the body, for comfort and removal of pressure. They are generally applied to the sacrum and coccyx, and should be used in all cases when a patient must sit up in bed permanently.

Preparation

Loosen the air valve and inflate by a tire pump, or place a piece of thin gauze over the valve, apply the lips and blow until the ring is firm to the touch, then screw the valve tight, as it is bound to leak sooner or later.

Method of covering

Bandage the air ring with 3-inch cotton roller, omitting the valve; follow with a 3-inch cotton bandage smoothly and evenly applied; finish by tucking the end under a fold of bandage. Lightly sprinkle the ring with talcum powder before applying.

The ring is sometimes placed in a pillow case when the opening is not essential.

Application

Grasp the inner circle of the ring opposite the valve and slip under the patient with the valve directed forward between the patient's thighs.

A second method is to turn the patient on his side facing the nurse. Place the air ring close behind the hips and roll the patient over on the ring. See that the patient is evenly balanced on the ring.

CANVAS CHEST SWATHE

This swathe is made of canvas with selvage edges. It should be 13 inches wide and of sufficient length to bind the chest and meet at the sternum in front. The swathe is held in place by webbing straps and buckles, which are sewn on 4 inches from the ends to allow for compression.

Purpose

It is applied when limited motion of the ribs is desired and for the comfort of the patient in cases of pneumonia, pleurisy, intercostal neuralgia, and in fractures of the ribs.

Application

Powder chest, back and axillary spaces. Protect the skin from contact with the rough canvas by a layer of sheet wadding about the body. Pad axillary spaces. The swathe is next applied evenly and held in place by slipping each strap through the opposite buckle. Gradually tighten every other buckle, from the bottom up, tightening the others going down so that the pressure is firm and even.

For additional security a cotton strap may be pinned in a V to the back of the swathe and each end carried over the patient's shoulders and pinned in front.

The swathe should be unfastened at least every other day, so that the patient's body may be bathed, powdered and the swathe readjusted.

TRIANGULAR SLING

Purpose

The triangular sling is used for comfort and support in injuries of the forearm and septic wounds of the hand.

Method of making

One square yard of cotton cloth folded in two diagonally should be sufficient for one double sling. Two single slings may be obtained from a square yard by cutting

through the diagonal fold from opposite corners. The double sling is more desirable when special support to the forearm is needed.

Application

The injured forearm is flexed at the desired angle, with the hand higher than the elbow and its palm inclined toward the patient's chest. One-half of the sling is slipped behind the flexed forearm, its end placed upon the opposite shoulder, and the apex of the sling is adjusted behind the elbow to be supported. The second end is brought over the outside of the forearm and over that shoulder. Both ends are tied under tension in a square knot behind the neck, slightly to one side or below the seventh cervical prominence, and pinned firmly to the clothing with a large safety pin. The loose ends of the knot are slipped under the sling at the neck. The apex is folded under the elbow and its base shirred evenly on a large safety pin about 3 inches above the elbow.

TRIANGULAR SLING APPLIED TO FOREARM

If the sling is a little too large and projects beyond the patient's fingers, a fold may be turned back a few inches,

as far as the first joint of the little finger. The hand should not be permitted to hang over the edge of the sling at the wrist, since this would interfere with the circulation and cause swelling of the hand.

CRAVAT OR WRIST SLING

A cravat sling may be made from a triangular sling or from a large square neck scarf, as a substitute, by folding the square into a triangle. The apex of the triangle is folded towards the center and again upon itself until the desired width is obtained, usually 4 or 5 inches.

Purpose

This sling may be applied in fractures or injuries of the upper arm, shoulder or collar bone; it may also be used in connection with a breast binder following amputations of the breast, for support of the arm on the side of the operation.

Application

Bend the forearm at the desired angle with the palm of the hand towards the patient's body and in the middle of the sling. Carry the ends of the sling over the shoulders and fasten to one side behind the neck in the same way as the triangular sling. The sling may be secured at the wrist with a safety pin and attached to the clothing if necessary for firm support.

FOUR-TAILED JAW BANDAGE

A four-tailed bandage can be made from a 5-inch cotton bandage; if greater width is desired cotton cloth may be used. Length, usually 36–38 inches.

Purpose

Used in injuries of the lower jaw for support and to hold dressings in place. Sometimes applied following the removal of adenoids and tonsils in children, and as a corrective measure against mouth breathing or snoring. In post-mortem cases it is used to hold the jaws together.

Method of making

Measure and cut the desired length of bandage. Fold end to end, then fold in two lengthwise and slit through to within 2 inches of the center. When at this point a small buttonhole opening is made as a landmark for the chin.

Application

In order to hold the jaw in position apply the opening to the tip of the patient's chin and carry the two upper tails straight with the line of the jaw to the back of the neck, and tie once. Carry the two lower tails acutely over the angle of the jaw and upward in front of the ears and tie securely in a square knot on the top of the head. Each bandage end on the top of the head is tied to the opposite one below.

In post-mortem cases a soft padding should be introduced between the bandage and the face.

THE TOURNIQUET

Purpose

A tourniquet is an appliance for the quick compression of an artery in a limb to check bleeding.

Those most commonly used in hospital practice are the Esmarch rubber bandage and the simple rubber tubing. Many substitutes can be improvised in emergencies and be used with a small, firm pad made from anything at hand, and applied directly above the bleeding artery for additional pressure.

The Esmarch rubber bandage is usually 5 feet long and is applied to an arm or leg in firm overlapping turns and held in place with an adjustable chain and hook.

The tourniquet of soft rubber tubing is frequently used in place of the Esmarch bandage in surgical amputations and applied above the line of incision as a provisional measure against bleeding.

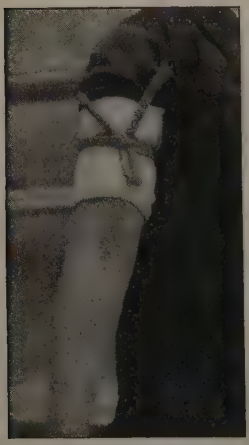
For application to the thigh the rubber tubing should be three to four feet long and three-fourths to one inch in diameter. For application above the knee or to the arm below the shoulder, two to three feet long, one-fourth to one-half inch in diameter.

Note: Following cases of amputation and other operations of the extremities where large blood vessels may be involved, as in septic and sloughing wounds, the rule is that a rubber tubing tourniquet in working order shall be attached to the head of the patient's bed in plain view, in case of an emergency.

Application

To permit greater compression without injury to the tissues underneath, bind a folded dressing towel firmly

about the limb above the bleeding point. Over the towel apply the rubber tourniquet by grasping it firmly in the middle between the thumb and index finger of each hand, stretch the tubing to its utmost and bind about the limb from the front backward, at the same time slipping the thumb and index finger along the tubing while applying it, to maintain its tension. When the limb is encircled bring the ends of the tubing forward and tie in a single bowknot and pull tight. The loop of the bowknot should be directed towards the end of the limb. When the tension is released the compression exerted by the tubing will be sufficient to stop the arterial bleeding. Test the artery for pulsation at a point below the tourniquet.



ARTERIAL COMPRESSION APPLICATION OF A RUBBER TUBING TOURNIQUET FOR COMPRESSION OF THE BRACHIAL ARTERY

The dangers attending too tight and too long continued application of a tourniquet are gangrene, thrombosis and nerve paralysis—perhaps involving permanent loss of function of arm or leg. Tourniquet should not be continuously applied for more than one-half hour.

The age of the patient, also, should be considered.

Use of the tourniquet in compressing a vein

When an opening or puncture of a vein is desired, to obtain blood for Wasserman test, blood culture or other purpose, slight compression is usually sufficient to retard

the venous circulation and thereby distend the superficial veins of the forearm. For this purpose a piece of rubber tubing 15 inches long and ¼-inch in diameter is bound about the upper arm once, crossed in front with slight tension, and the two ends of the tubing held in place by tying in a loop, or sometimes fastened with a pair of hemostats. No towel is used under the tubing; and only enough tension is used to engorge the veins at the bend of the elbow. Having the patient close the fist or slapping the skin over the veins helps to make them become prominent.

VENOUS COMPRESSION
IN THE VENOUS COMPRESSION THE ABSENCE OF THE TOWEL IS TO BE NOTED

XXIII

METHOD OF TAKING TEMPERATURE, PULSE AND RESPIRATION

TEMPERATURE

Equipment

A deep agate or glass tray containing four thermometer glasses, two of which are filled with corrosive sublimate 1–2000, one labeled "No. 1," the other, "No. 2."

The other two glasses containing water, one labeled "before," the other, "after." A pledget of absorbent cotton is placed in the bottom of each glass to prevent breakage of thermometer bulbs. Squares made from paper napkins 4 by 4 inches for wiping thermometers. Thermometers for mouth, rectal and special cases.

Petrolatum for rectal thermometers.

Varieties of thermometers and their uses

The silver-bulbed mouth and rectal thermometers are for general use. Red-bulbed mouth and rectal thermometers are reserved for typhoid patients and kept in 2% formalin solution. Blue-bulbed mouth and rectal thermometers are reserved for all other special patients. In all cases the rectal thermometers are used also for taking axillary temperatures.

On surgical wards eight or more thermometers are used, divided into two groups, and kept in two glasses of corrosive sublimate labeled, No. 1 and No. 2. On the medical and children's wards each patient has his thermometer, which is kept in a separate glass.

Where each patient has his own thermometer one glass

of water is used besides the one with the corrosive sublimate, with the small squares of paper for drying.

Routine taking of temperatures

By mouth

Remove the four thermometers, one at a time, from glass No. 1 and distribute thus: Dip in glass of water labeled "before" to wash off disinfectant. Wipe with a paper square. Hold it in one hand horizontally almost on a level with the eyes and observe if the thread of mercury is below the scale of 95°; if not, with a sharp inward turn of the wrist the mercury is shaken down, the thermometer being held near its upper end between the thumb and index finger.

Ambulatory patients should be seated before receiving the thermometer.

Place under the patient's tongue, slightly to one side, where it is held in position by the lips. Note the time and remove promptly in three or five minutes, according to the time of registration of the thermometer. The reading is made and noted on the chart.

The normal temperature is 98.6°–99°F. in women, and 98°–98.6° in men.

On removal from patient's mouth wipe, shake down mercury and treat as follows: Wash in glass labeled "after." Wipe with a paper square and replace in corrosive sublimate in glass No. 1, to remain during the distribution of thermometers from glass No. 2, which will permit disinfection between each group.

When through with the thermometers they should be washed in warm soapy water, rinsed in clear warm water, the mercury shaken down, and the thermometers

replaced in fresh corrosive sublimate solution. Hot water is to be avoided, as it will cause the mercury to expand and burst the bulb.

Rectal

For this purpose a thermometer with a special bulbous end is used and kept in its own special glass of solution. In taking this temperature it is more convenient to have the patient on one side.

The thermometer is removed from the disinfectant, rinsed, dried, inspected, lubricated, and grasped at its end with the tips of the fingers. It is carefully and slowly rotated into the rectum about one and a half inches. It is held in position by the nurse for three minutes. On removal the lubricant is wiped off, the reading made and noted on the chart. The thermometer is washed in cold water and then in warm soapy water, wiped dry, the mercury shaken down, and the thermometer replaced in the disinfectant.

For accuracy, all children under eight years should have temperature taken by rectum. Because this may excite the child and so increase the rate of pulse and respiration, both should be recorded before the temperature is taken.

The normal rectal temperature in children under eight years may range from 98°–99.8°F. In infants a temperature of 98°–99° should be maintained constantly.

Axillary

This method is used if the patient is feeble or irrational, or when it is unsafe to take the temperature in another way.

A rectal thermometer is used because of its greater adaptability, insuring greater accuracy. Dry the arm pit,

shake down the thermometer and introduce the bulb into the armpit. Flex the forearm and place the patient's hand against the opposite shoulder. This position is held for ten minutes, and the nurse should support the elbow.

Groin

The same routine is carried out as in taking axillary temperature, using a rectal thermometer. The knee on that side is flexed for ten minutes and the foot crossed over the other leg. The knee may be held in position by the nurse.

Observations to insure accuracy in taking temperatures

The thermometer must register correctly.

The mercury is shaken down below 95°.

By mouth

The patient should not talk or fall asleep before the removal of the thermometer; it must be observed that he is not too feeble, is not a mouth breather, and does not cough, *i.e.*, that he may be able to hold his lips closed over the thermometer.

Nothing hot or cold is to be taken by mouth within fifteen minutes before taking the temperature.

The patient must be neither hysterical nor irrational. In cases where there is an element of hysteria there is a tendency on the part of the patient to tamper with the thermometer in order to send up the mercury to make an impression on the doctors and nurses. Such schemes are used as removing the thermometer from the mouth and holding it over a hot register, placing it on a hot water bag, dipping it into hot drinks; or friction, as rubbing

the bulb on the blanket. In such cases the mercury registers much higher in proportion to the rate of the pulse and respiration, and the temperature should be taken again with another thermometer in the presence of the nurse.

An irrational patient may bite off the bulb and swallow the mercury and glass unless the nurse quickly removes them from his mouth with her fingers.

By rectum

For safety only a rectal thermometer is used.

The rectum should be clear.

The thermometer should always be held by the nurse to prevent breakage in the rectum.

The temperature is not taken within fifteen minutes of an enema.

By axilla or groin

See that the bulb of the thermometer is enclosed and not projecting outside the armpit or groin.

THE PULSE

The pulse is the expansion of an artery following the contraction, or systole, of the heart, and is ordinarily taken at the radial artery on the thumb side of the left wrist. For comparison with the left radial it is sometimes taken on the right radial, at the temporal artery in front of the ears, on the facial in front of the angle of the lower jaw, or at the dorsalis pedis in a line with the great toe.

The important observations to be made in studying the pulse are the rate or frequency, rhythm, force, volume, tension, and comparison of radial pulses if the left is difficult to find.

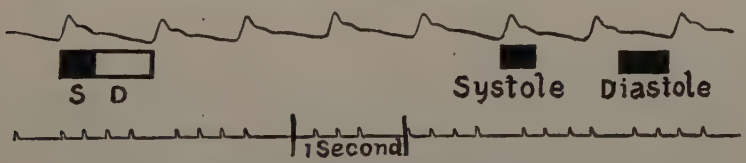
The normal rate of the pulse ranges from 72–80 per minute in women; 60–74 in men; 80–100 in children; 130–120 in infants, the rate lessening as the age increases.

Method of taking pulse

With the patient's hand resting on his chest the nurse takes the radial pulse by placing the first three finger tips over the artery with moderate pressure. For greater accuracy the rhythm of the pulse should be noted before counting it. The pulse is counted for one whole minute by the second dial of the watch. Lip counting is better than counting to one's self, as one can better concentrate and the mind is not so apt to wander.

In studying the quality of the pulse one may be guided by the resistance of the artery on expansion, which can be felt against the finger tips on making moderate pressure.

In counting irregular or intermittent pulses it is well to note the number of beats the first half minute, then compare with the number in the last half minute.



TRACING OF A NORMAL PULSE

Method of taking apex beat

The apex beat of the heart may be heard and counted by means of a stethoscope, or by pressing one's ear against the left side of the patient's chest. While taking the apex beat it is customary to have the radial pulse taken at the

same time for comparison. One nurse takes the apex beat with the stethoscope placed over the fifth intercostal space, slightly below the left nipple, while the second nurse holds the watch and takes the pulse at the radial. Both are counted a whole minute and recorded. See notes on charting apex beat.

METHOD OF TAKING THE BLOOD PRESSURE

For more accurate knowledge of the tension or pressure exerted by the blood in its circulation through its vessels than can be gained by taking the pulse in the ordinary way, an instrument known as a sphygmomanometer is used, sphygmos being the Greek term for pulse, and manometer the scale which registers its pressure. It is often the nurse's duty to use this instrument in conditions where the observations of the systolic pressure are necessary, also sometimes the diastolic pressure; in such cases as are attended by shock or hemorrhage, where the blood pressure is low or below normal; in cases of fractured skull or any other conditions causing cerebral pressure; in toxemia of pregnancy; and in acute cardiac diseases where the blood pressure may be high. The blood pressure is sometimes taken at two-hourly or four-hourly periods, while the crisis lasts; in other cases it is taken regularly, morning and evening.

The sphygmomanometer consists of (1) a square elastic bag enclosed in a sateen cuff, which is wrapped snugly about the arm above the elbow; (2) an air bulb for inflating the bag; (3) a round dial which registers the blood pressure. Both are attached to the lower edge of the bag by a short length of rubber tubing.

As a rule, the auscultation method is used by placing a stethoscope over the brachial artery, close to the lower edge of the cuff. The air bulb is worked, and the rubber bag inflated until its pressure causes the pulsation of the artery to disappear entirely. Then as the air is slowly let out, the pulsation will reappear again, and become distinct. The first hearing is the systolic pressure, which is observed on the manometer or dial. As the pulsation becomes fuller, then recedes, and before it finally disappears, the last point of hearing is the diastolic pressure, which is also observed on the manometer, and charted as indicated.

The range of normal blood pressure is

$$\frac{120S}{80D} \text{ — } \frac{140S}{100D}$$

THE SPHYGMOMANOMETER

The bag is wrapped around the arm; above it is the dial; at the left the air bulb

RESPIRATION

Method of taking respiration with pulse

Without removing her fingers from the patient's wrist the nurse allows the back of her hand to rest lightly on the patient's chest, when the respirations are easily counted with each respiratory movement. This method is especially useful when caring for a self-conscious, nervous patient.

As a rule the respirations should be counted a whole minute, especially in case of diseases of the respiratory and circulatory tracts and following operations on the abdominal cavity, when increased rate should be noted. In cases when morphine or codein is being administered regularly for a period, decreased rate should be noted and not be permitted to go below 12 without calling medical attention.

In the case of unconscious patients the respirations may be counted by the rise and fall of the chest and abdomen.

In the case of a child, record the pulse and respiration before taking the temperature.

The normal rate of respiration per minute is 18–22 in women; 16–20 in men; 20–30 in children, and 30–40 in infants.

XXIV

CHARTING

Purpose

A clinical chart is a bedside record on which are noted daily, four-hourly or hourly statistics whereby the doctor is kept informed of the patient's condition.

In hospitals such charts are kept in detailed form and bound with the patient's history and other data pertaining to his case, for future reference. Different hospitals use different outlines for their own convenience.

Technic

The perfection of charting depends on one's natural inclination toward neatness in detail and on good penmanship. A knowledge of drawing is helpful.

In order to keep a clearly outlined chart, use a fine pen and ink free from sediment.

The dots should be spherical, not too large, of uniform size, with connecting lines light and straight. The dot should be kept free from the perpendicular line of each square. This helps to make the chart clear.

The nurse is not permitted to make repairs and erasures. These are attended to by the librarian.

Description of a typical chart

At the head of the chart is the patient's name, date of admission, ward, etc. Below, the body of the chart is ruled off in small squares.

The whole area is horizontally divided by heavier lines into four spaces, in which are recorded, *first,* number of dejections in a day, the days of the month, and, if a four-hourly chart, the hours at which temperature should be taken; *second,* temperature (in the first space are printed the letters M and E, morning and evening, indicating when the last temperature was taken, if a daily chart); *third,* pulse; *fourth,* respiration.

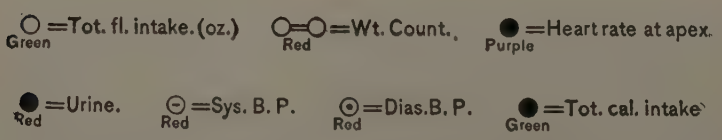
On the left-hand margin are sets of figures which designate the rate of the temperature, pulse or respiration recorded in the corresponding square, the fluid intake and output, and the blood pressure, *i.e.,* diastole and systole at the extreme left.

Abbreviations and methods of recording

Temperature, pulse, respiration. Solid black dots and lines are used in proper spaces for temperature, pulse and respiration.

Solid red dots and lines indicate rectal temperature.

A red "ax" over solid black dots signifies axillary temperature. Solid purple dots and lines signify the apex beat.



Blood pressure. A hollow red sphere with connecting lines carried through its center represents systolic pressure. A hollow red sphere with a dot in the middle represents diastolic pressure.

White count is occasionally charted with red spheres and connecting double lines, dumb-bell fashion.

Calories. Solid green dots with connecting lines record total caloric intake in 24 hours.

Fluid intake. Green circles with connecting lines record total fluid intake in ounces in 24 hours.

Urine. Solid red dots with connecting lines represent total output of urine, in ounces, in 24 hours. When night and day urine are measured separately there are two rows of red dots, the upper being the total amount and the lower being the night amount; the marginal figures in the respiration and pulse spaces being used to count the ounces.

Dejecta are noted by straight lines in black ink, in the first row of squares corresponding to date. Perpendicular lines represent dejecta during the day; horizontal, those at night. If a cleansing enema has been given it is recorded in red, in temperature space of 103°, *i.e.,* suds enema or M. G. & W., etc., according to the kind given.

Transfers and discharges. All transfers from one ward to another are written perpendicularly in red ink in the pulse division under the date of transfer.

All discharges of patients from the hospital are written in black ink in pulse division under the proper date. Statement should be made as to where patient went, to O. P. D., to L. M. D., or to another hospital, giving name. The only conditions now noted at time of discharge are "Against advice" and "To Allen Street House," the mortuary, if a discharge after death. The hour and minutes of the time of death are also stated.

Surgical cases. Following an operation the word "operation" is written perpendicularly in the respiration

division under the proper date in red ink. Beginning with the day after operation the number of each day is placed in the consecutive spaces until discharge. This figure is a guide to the surgeon for the time of removal of stitches and other observations.

Weight. The patient's weekly weight may be written on the medical chart in the last space of the respiration division.

Special notes. Many other incidents are noted, as in case of Widal's reaction in typhoid fever; if a hemorrhage or sputa, the amount in ounces; the injection of salvarsan, insulin, etc.; any special rise of temperature, as that following a chill, or a drop, as that related to the crisis of pneumonia; transfusion and fluids from paracentesis.

Bedside notes

In addition to clinical charts, nurses may be expected to keep bedside notes in which are recorded clearly written facts in bulletin fashion, as follows:

Nourishment, amount taken; whether solid or liquid; estimated quantity each time.

Medicine and treatments, if on forced fluids, the quantity taken each time; if enemata, when given, results obtained, if given for distention, note if flatus has been expelled.

If food or medicine has not been taken, the reason for failure to carry out treatment should be noted, *i.e.,* if patient was asleep at the hour, or refused, or could not be persuaded to take nourishment or medicine.

Vomiting, all other than that following an anesthetic should be described if unusual in character.

Elimination of wastes, urine measured each time it is passed and dejecta noted.

Sleep, whether in naps or consecutive hours; its nature, whether restless or otherwise; if wakeful, the cause.

Pain, its location, duration and nature; whether continuous or intermittent.

Change in condition. Every change should be noted; if a chill, time and duration, temperature by rectum during chill and after, if vomiting during chill.

Mental cases, whether depressed, suicidal, or exhilarated. Hallucinations and their nature. For diagnostic purposes a verbatim report of what the patient says is necessary.

Emergencies. In cases of accident, escape of a delirious patient, or sudden death, a nurse should be prepared to give an accurate and full report, to the entire satisfaction of those to whom she is responsible.

XXV

ENEMATA

Purpose

An enema is a quantity of fluid introduced into the large intestine through the rectum, for local or systemic treatment. There are different kinds, prepared in various ways to treat the conditions for which they may be ordered.

Those most commonly given are for purgative purposes, for relief of gas and distention, for stimulation of the circulation, for increase of body fluids, for medication, and occasionally for nutritive purposes.

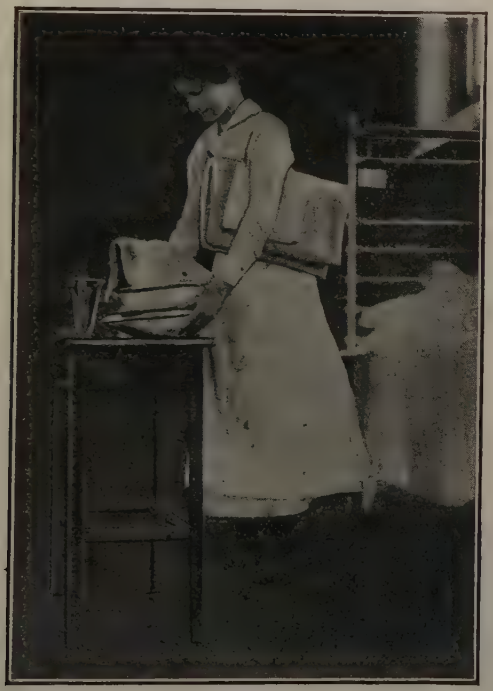
Enemata are usually given with the patient in the lateral or dorsal position, sometimes in the knee-chest position. To get results it is sometimes advisable to remove the pillows and place one under the patient's hips.

The routine of administration is about the same in most cases. The purgative or suds enema is taken as an example of procedure.

Preparation of a purgative or suds enema

Into an agate pitcher measure two tablespoons soft soap or soap jelly and a little hot water. Mix thoroughly, then add sufficient water to make one quart and mix again. Skim off soap bubbles. Temperature should be 102° F.

The pitcher of soapy solution is placed in basin and covered with hopper towel. Connect rectal tube and tubing. Fit a folded piece of toilet paper over the index



METHOD OF CARRYING EQUIPMENT
FOR AN ENEMA

finger, remove, invert and into it pour a little lubricant. Wrap it about the tip of the rectal tube. Place in basin with pitcher and carry all equipment to bedside at one time.

Equipment

gray blanket
half sheet and rubber protector
hopper towel
washed gauze
agate pitcher
enameled basin
rectal lubricant
rectal tube, glass connecting tube, tubing and funnel
bath thermometer
bedpan (warmed)

Preparation at bedside

If a new patient, tell him what is to be done.

Place bedpan under bed and arrange remainder of equipment in order on the table.

If on an open ward, screen bed thoroughly.

Preparation of patient in lateral position

Turn upper bedclothing back to thighs. Place doubled gray blanket over patient. Move patient to opposite side of bed. Arrange half sheet and rubber on this side of bed. Draw patient onto half sheet and turn him over in the semi-prone position, with hips even with the edge of bed, and with the upper knee strongly flexed. Slip hopper towel under the nightgown and over buttocks and turn back nightgown.

Procedure

Place basin and pitcher on the bed behind the patient's knees. Hold the funnel by slipping the index finger

through its handle and with the thumb hold the rectal tube pinched against the outside of the handle with its tip above the edge of the funnel.

With the other hand pour solution into tubing until it rises into the funnel. In order to expel the air a small quantity of solution is allowed to pass out of end of tube back into the pitcher.

The tubing is sharply bent upon itself at the tip of the funnel and the remaining solution in the funnel is poured out to avoid spilling.

The rectal tube is taken in one hand while funnel is held between thumb and finger of the other hand, and with remaining fingers or back of the hand the patient's buttock is slightly elevated while the tube is slowly introduced into the rectum, about four or five inches, or at least within the internal anal sphincter.

Before the solution is permitted to run out of the tubing the funnel is filled, then the pressure on the tubing under the thumb is gradually released to permit the escape of the solution into the rectum. The enema is given slowly by regulating the pressure with the fingers on the tubing, at the same time gradually elevating the funnel 6 inches above the hips. Before the solution is allowed to run out completely the funnel is refilled at regular intervals to prevent admission of air.

On completion of the operation, a valve is again made by bending tubing sharply over tip of funnel to check entrance of air. The tube is slowly withdrawn, and pressure may be made with the towel against the anus to prevent contents being expelled. The nurse withdraws her hand, and the patient is dried with hopper towel and turned on back, then moved to center of bed on half sheet

and rubber. As protection to the edges of the upper bedclothing the lower ends of the half sheet and rubber are drawn up between the patient's thighs and folded back upon the pubes. The gray blanket covering the patient is adjusted and the patient is instructed to draw up the knees while the nurse with one hand supports the sacrum, and with the other introduces the bedpan, slightly sideways, in such a manner that the wedge-shaped end shall first come in contact with back of the nurse's supporting hand. Nurse now withdraws her hand and sees that the patient is left as comfortable as possible. All equipment is then carried out, except washed gauze.

Note: In order to get good results the patient should be advised to retain enema as long as possible.

Care of utensils

While the patient is on the bedpan the utensils are cared for as follows:

Separate rectal tube from glass connecting tube, wipe with toilet paper and hold opening under cold running water. Then wash with warm soapy water in a basin. Wrap tube loosely in gauze, place in boiling water and boil for three minutes. Dry and put away.

Cleanse funnel and attached tubing, dry and hang up.

Wash and dry pitcher and put away.

After care

Return to bedside with a basin of warm soapy water. Support patient's back with one hand and with the other remove the bedpan carefully.

Glance hastily at contents, for results, and quickly cover.

Local bathing is done, gray blanket and half sheet and rubber are removed, and patient left comfortable.

Record fecal and gas results on chart. If none, report to nurse in charge.

The remainder of equipment is carried out to lavatory.

Before emptying bedpan notice nature of fecal result, *i.e.*, the consistency, whether liquid, semi-solid, formed, or in hardened, round lumps (scybala).

The presence of anything unusual should be observed, such as blood, pus, intestinal parasites, etc. Such stools should be saved and reported. If ordered to be sent to the pathological laboratory, the contents of the bedpan should be put in a special jar and be tagged with ward, patient's name and date.

With children the same observations are made regarding fecal discharges. The nurse should note also if foul smelling, green in color, presence of curds, mucus, undigested food, etc. If a child has swallowed a foreign body, stools should be carefully investigated.

If anything unusual in infant's stools, diapers should be saved in a closely covered utensil.

Procedure with patient in the dorsal position

Turn back blanket and spread as far as the knees, and place a folded blanket over the patient's body. Slip the half sheet and rubber under the hips. Follow with the bedpan on which the patient lies with knees flexed and thighs separated. Protect the edge of the folded back bedclothing with a hopper towel, or lower ends of half sheet and rubber.

Locate the anus with the tip of the second finger of one hand and with the other hand introduce the rectal tube and give the enema in the usual way.

Retained enema

If several enemata have been given to a patient in the course of a day without fecal result, note whether the amount of fluid passed off has been nearly equal to that which has been given. If not, report. If the enema has not been absorbed the patient will complain of great discomfort from fluid distention. The bowel may be drained of the retained fluid as follows:

Turn the patient on his side and insert rectal tube six inches or more. Attach funnel. Place bedpan on floor or chair and invert funnel over pan in order to drain colon.

Fecal impaction

This is the lodgment of a hard fecal mass in the rectum or above. This condition is often overlooked by an unobserving nurse, and is the cause of much suffering to the patient. He usually complains of rectal distress and may have passages of watery stools. Sometimes the condition is accidentally discovered by obstruction of the rectal tube while attempting to give an enema.

A digital rectal examination is usually made by using a lubricated finger cot or soapy index finger. If unable to locate impaction by this means an oil enema will probably be ordered, followed later with a suds enema.

If there is an impaction in the rectum, mechanical removal may be necessary.

PURGATIVE AND CARMINATIVE ENEMAS

M. G. and W. enema

magnesium sulphate saturated solution
glycerine } of each
water } two ounces

The magnesium sulphate is mixed in a graduate containing a thermometer. The graduate is then placed in a pitcher of hot water until the desired temperature is reached.

Milk and molasses enema

molasses } six ounces
milk } of each

Heat milk to 110° F. Add molasses, stir slowly. Follow in one hour with a second enema, of plain hot water.

Oxgall enema

oxgall, two ounces
suds, one pint

Mix thoroughly.

Turpentine enema

In using turpentine in enemata, it should be thoroughly mixed with the second ingredient, as it is highly irritating. The anal region should be washed with soap and water following the enema.

Method I

turpentine, two drams
yolk of one egg

Beat turpentine and yolk or with a small quantity of suds, then add to one pint of suds and stir thoroughly.

Method II

turpentine, two drams
oil, six ounces

Add turpentine slowly to warm olive or cottonseed oil. Mix thoroughly. Give through a warm rectal tube. Follow in one hour with a suds enema.

Peppermint enema

oil of peppermint, two drams
soapsuds, one pint

Mix the peppermint with the soapsuds.

M. G. and T. enema

magnesium sulphate saturated solution, two ounces
glycerine, two ounces
turpentine, two drams
water sufficient to make one pint

Mix turpentine and glycerine together and add remainder of the formula.

Purgative enema for a child

Into a pitcher measure one tablespoon of ivory soap jelly, one pint of water at a temperature 100° F. Use a No. 20 American rectal tube. Give to the patient when in a dorsal position on a small sized bedpan.

If for an infant, the quantity of solution may be anywhere from six to eight ounces, and should be given with a soft-tipped Davol ear syringe. A kidney basin is used instead of a bedpan.

The use of soft soap should be avoided in the case of children because of its irritating qualities.

In place of an enema glycerine or soap suppositories are sometimes ordered.

LUBRICATING ENEMATA

Oil enema

Oil enemata are given to soften fecal impaction in extreme constipation and to insure evacuation without straining, following restricted action of the bowels after rectal operations or perineorrhaphies.

Pour six ounces cottonseed oil into a pint graduate. Place it in a pitcher of hot water and let remain until temperature of oil is raised to 100° F. Test with a dairy thermometer.

Place rectal tube and funnel in a basin of hot water and carry to bedside. This enema may be ordered given to the patient in the knee-chest position or in the usual way.

Good results have been obtained by giving at bedtime to be retained until the following morning, when a suds enema is given.

Olive or other vegetable oil may be substituted for cottonseed oil.

ENEMATA TO GUARD AGAINST ACIDOSIS

Glucose enema

glucose, 10–15%
saline solution or sterile water } ten ounces

Alkaline enema

For an adult

soda bicarbonate, one level teaspoon
water, eight ounces
Given at 110° F.

For a child

soda bicarbonate, twenty grains, in tablet form
normal saline solution or water, six ounces

FOR X RAY DIAGNOSIS

Barium enema

barium sulphate, seven ounces
potato gruel, one quart

Equipment

agate pitcher
enameled basin
two-quart irrigating can
four or five feet rubber tubing to fit can
special 3-inch metal rectal tube
hook to suspend the can
hopper towel
rectal lubricant
barium sulphate
potato gruel
cupful of lukewarm water

In place of the metal rectal tube an ordinary large sized rubber rectal tube, American No. 22, with opening at extremity like a stomach tube, may be used.

Preparation of potato gruel

Two teaspoonfuls of potato flour to one quart of water. Mix gradually in a small quantity of cold water, then stir into the larger quantity of water. Boil for five minutes. If too thick, thin with sufficient water so that it will pass through the rectal tube easily, like a thin cream.

Preparation of barium sulphate

Mix barium sulphate in agate pitcher with sufficient water to form a consistency of soft lumpless paste. It is important that this process of mixing should be thoroughly done to avoid obstruction of the rectal tube. Add one quart of warm (100° F.) potato gruel slowly and stir.

Administration

Attach rubber tubing to irrigating can or irrigator and rectal tube. Pour the cup of lukewarm water into the irrigator to expel the air from the tubing, then empty the contents of the agate pitcher into the irrigator. Pinch the tube and quickly suspend about four feet above the patient's body. Lubricate and introduce, if the metal rectal tube, its full length into the rectum. Release the pressure on the rubber tubing and allow the enema to flow. If the patient complains of discomfort, which may be from a gas bubble, permit him to change his position slowly for relief.

Procedures for Nutritive and Shock Enemata are given in Part II.

XXVI

VAGINAL DOUCHE

A douche is a flow of water or solution usually directed from outside into a cavity of an organ, as the vaginal canal.

Purpose

It is used as an agent for cleansing and disinfection, for applying heat to inflamed parts, and for astringent action.

Equipment

gray blanket
half sheet and rubber
hopper towel
washed gauze
agate basin
douche pail
douche pan
douche nozzle (glass)
solution as ordered

In case of perineal operation

Add the following to the regular equipment:
two packages sterile gauze
sterile pad
T bandage
rubber or glass catheter No. 9, in place of glass douche nozzle

Points to be observed in giving douche

The nurse's hands should be thoroughly scrubbed in soap and water both before and after this procedure.

In giving any vaginal douche the nurse is warned against touching her face with her hands. In case of getting any discharge into her eyes she should report for immediate treatment.

In using mercurial tablets, in making up the solution see that they are thoroughly dissolved before giving the douche.

If there is any difficulty in introducing the douche nozzle into the vaginal canal, do not use force; suspect the presence of a tampon or sponge, or malformation of the canal.

Following the operation of perineorrhaphy, to avoid straining the stitches a sterile rubber or glass urinary catheter should be used unless otherwise specified. After the douche is given see that the stitches are perfectly dry and place a sterile folded gauze sponge under them on each side to protect from moisture and prevent irritation of opposing surfaces of the skin. Over all a sterile pad should be securely fastened with a T binder.

Preparation of douche

Place the douche pail on the bridge of the douche pan and clamp the tubing. Carefully estimate, according to rule, the strength of the solution ordered, measure that and the amount of water needed, and test the mixture with a bath thermometer until the desired temperature is reached.

Remove the glass douche nozzle by its projecting end from the jar of solution and inspect for defects. Do not

handle below that end. Attach to rubber tubing and suspend in the pail; bend the handle of the pail over the tubing to hold it in place.

Put the washed gauze and sterile supplies, when needed, in the agate basin and place over the douche pail. Cover all with a clean hopper towel.

The folded blanket, half sheet and rubber are tucked under the nurse's arm, which leaves both hands free to carry utensils to the bedside.

Procedure

With patient in dorsal position turn up nightgown to waist line.

Turn down upper bedclothing, except sheet, in two folds at foot of bed.

Turn back sheet to waist line.

Place folded gray blanket across upper body.

Insert half sheet, and rubber protector under the patient.

Remove hopper towel and place douche pail in position 2 or 3 feet above patient.

Pad the douche pan with folded towel. Instruct patient to flex knees and raise herself with feet flat on bed. Nurse supports sacrum with one hand and slips douche pan under with other. The patient's hips should be brought forward over the edge of the bridge of the douche pan to prevent the solution running back into the bed.

Remove one pillow and place on foot of bed.

Tuck in blanket over shoulder on each side.

Arrange upper sheet to form a V in the middle. The ends of the V are caught on each side of the patient, leaving room for the introduction of nurse's hand.

Grasp douche nozzle at its highest point. (See again that it is perfect.) Open the clamp and direct solution into pan to expel air and to equalize temperature of solution in tubing. Pinch clamp.

Separate vulva with washed gauze. Wipe, if any evident discharge. Carefully introduce douche nozzle downward and backward in vaginal canal. Open clamp.

If there is any discharge, gently rotate nozzle to aid escape.

Clamp tubing before water is quite out of douche pail. Remove nozzle with gauze, and place in basin. Remove douche pan. Replace pillow under patient's head. Dry patient with washed gauze and place gauze in basin.

Remove half sheet and rubber. Draw up sheet and remove gray blanket. Pull down nightgown, make patient comfortable and adjust upper bedclothing.

Remove utensils, cover with hopper towel, and carry all equipment in one trip to lavatory.

Observations

Note if any discharge in douche pan. Note color. If pus, it will sink to bottom. If excess of mucus, white shreds will be noted floating in the solution.

After care of equipment

Empty douche pan into hopper. If no sterilizer, wash in soapsuds, scald inside and out, disinfect, and dry. Wash and scald douche pail, dry tubing. Wash nozzle in cold water, then in hot soap suds. Wrap loosely in gauze, place in tepid water, and boil five minutes. Remove and place in jar of boric solution 1–25. Dispose of gauze in regular pail.

XXVII

PRECAUTION VAGINAL DOUCHE

The term "special precaution," or "g. c. precaution," here implies that the patient has an acute local gonorrheal infection of the pelvic organs, a venereal disease characterized by a yellowish vaginal discharge. This condition calls for the exercise by the nurse of certain rules for her own protection and for the prevention of the spread of the disease to other patients.

When giving this douche the nurse must remain at the patient's bedside until the treatment is entirely completed. She cannot attend to other patients until her hands are thoroughly scrubbed and disinfected at the end of the operation.

The patient should not be permitted to assist in removing the pad or T binder.

The nurse must keep her hands away from her face and eyes during this procedure, and should avoid bending too closely over the field of operation while giving the douche.

If by accident she should get any discharge into her eyes, she should report *at once* for treatment.

Gonorrheal vaginitis in children is highly communicable and calls for strict precautions on the part of the nurse. All vaginal discharges should be reported and diapers kept apart in a special covered utensil. Such cases are isolated immediately. For safety vaginal cultures are taken on admission to the children's ward to prevent the spread of the disease.

Special individual equipment

cotton half sheet
rubber protector
rubber table cover
gray blanket
bundled in a special half sheet, tagged for that special patient and kept at bedside

agate basin, lined with newspaper, containing washed gauze, a clean pad wrapped in a dressing towel, rubber gloves, and a clean T binder, if needed

douche pan, douche pail, rubber tubing with detachable piece 12 inches long, and glass connecting tube

special overall apron for the nurse kept in a pillow case at the bedside

Procedure

Prepare solution and utensils.

Carry all equipment to bedside, covered with hopper towel.

Cover bedside table with rubber and on that place the utensils.

Put on apron and gloves.

Place douche pail on head of bed and pad douche pan with hopper towel.

Remove materials from basin to table.

Open bundle.

Preparation of patient

With patient in dorsal position turn down upper bedclothing as in ordinary douche.

Remove pillow from beneath patient's head and place on foot of bed.

Slip half sheet and rubber under the patient. Turn back nightgown.

Unpin T binder, remove pad and place in empty basin. Fold end of binder upon itself without removal and tuck out of the way.

Adjust douche pan.

Drape patient and fold a dressing towel over the V in the center of the sheet to prevent contact with the douche nozzle on its removal.

If discharge is profuse, sponge downward with dry gauze, which is placed in basin with soiled pad.

Douche

Run some of the solution into the douche pan to equalize temperature and to expel air.

Separate vulva with gauze. Introduce nozzle in usual way. In case of profuse discharge the nozzle should be rotated in the vaginal tract while the solution is running, to aid in thorough cleansing.

Before the solution is quite run out, clamp the tubing.

Remove nozzle, detachable tubing and glass connecting tube, all together, and place in basin.

Wrap in gauze the end of tubing attached to pail and catch under handle of pail.

Loosen sheet and blanket on each side of patient.

Dry patient with gauze. Remove douche pan. Apply clean pad and adjust T binder.

Slip out half sheet and rubber. Fold upper side in and replace in special half sheet.

Remove gloves and place in basin. Replace pillow. Pin T binder and adjust nightgown.

Remove blanket, fold and place with half sheet and rubber protectors. Bundle in special half sheet and tag.

Remove apron by slipping it off at the shoulders. Then

grasping the edges of the cuffs, pull both sleeves outside in. Fold the clean sides of apron together and place in pillow case.

Leave bedside in order. Carry remaining equipment to lavatory.

After care of special equipment

Empty douche pan into hopper. If no sterilizer, wash in soapsuds, scald inside and out, dry, tag, and keep apart.

Wash and scald douche pail, disinfect and dry tubing.

In the special basin wash nozzle and detachable rubber tubing in cold water and then in hot soapsuds. Wrap loosely in gauze, place in tepid water, and boil five minutes. Remove and place in special jar in corrosive sublimate 1–2000.

The soiled pad is placed in a paper bag to be burned, and gauze which has been used in the operation is placed in regular gauze pail.

Basin should be washed and sterilized, and kept for this special purpose.

Wash rubber gloves inside and out in cold water, then in hot suds. Wrap in gauze and boil ten minutes. Dry and powder on both sides. Match and wrap in clean towel.

Personal precautions

Scrub and disinfect hands in special basin. Empty contents into hopper and sterilize the basin.

XXVIII

CATHETERIZATION

Purpose

To empty the urinary bladder in retention when other means have failed, or before or following operations on genito-urinary organs.

To obtain a sterile specimen of urine.

For a renal function test.

Equipment

dressing tray on which are four packages sterile picked cotton
2 kidney basins
round basin for soiled sponges
2 glass finger bowls, one with warm, soapy solution, the other with boric solution 2%
2 sterile rubber catheters, size No. 7 or No. 8 Am., in a sterile towel
bottle of sterile catheter lubricant
large sheet
half sheet and rubber protector
gray blanket

Procedure

Preparation of patient and materials

Dorsal position.

Turn nightgown back out of the way.

Turn down upper bedclothing slightly below waist line.

Fold gray blanket in two, place over patient's chest, and turn up above pubes.

Slip half sheet and rubber under the patient. Tuck gray blanket on both sides without confining the patient.

The draping of the patient is done with the large sheet put on cornerwise.[1] The upper corner is first folded under itself and the sheet is wrapped around the patient's waist to hold it in place. The remainder of the sheet is used to turn down the bedclothing in two folds at the foot of the bed. The outer corners are used to envelop each leg and foot and the lower corner is arranged to hang loosely in a point between the patient's thighs.

Place the sterile towel containing catheters on foot of bed, open carefully, avoiding unsterile contact. Turn out two packages of picked cotton on sterile towel, pour a little lubricant on one package and cover over. Open the two remaining packages, one being dropped into soapy solution and the other into boric solution.

Place the kidney basin in the space between the patient's knees. Move the bedside table with tray to the side of bed near the foot. Separate picked cotton in soapy solution into four sponges and use to wash the vulva, the last two wrung out tight to dry the patient.

The nurse's "scrub-up"

Roll sleeves above elbows securely, an ordinary elastic band serving to hold them. From the elbow down, with the nail brush systematically scrub each forearm and hand with quick and vigorous action, two minutes by a watch or clock being allowed for each arm and hand.

In scrubbing, encircle the forearm from the elbow, working down to wrists, back of hand, between and

[1] Laparotomy stockings may be used in place of a sheet.

around each finger, finishing with palm and finger nails, on which the most time is spent.

Clean the nails with orange wood stick and scrub again, dipping the brush frequently in the water during the process.

Running water should be used when there is a mixer; if not, a basin of fresh water should be used for each hand and arm. The water should be as hot as can be borne.

Do not go over surface already scrubbed unless contaminated. To remove soap suds wash hands in clear hot water for one minute. Finally, manipulate hands in hot bichloride solution 1-2000 for two minutes, using not less than a quart of solution.

The fingers of one hand should be clasped within the other, and held away from the nurse's person, avoiding contact with surroundings, also, until the bedside is reached.

Catheterization

Separate picked cotton which is in the boric solution into six sponges.

Turn back point of the draping sheet with little finger of left hand, which is not again brought in contact with clean surfaces.

Separate vulva with sponge held between thumb and first finger of left hand. The sponge is held there until the operation is over.

Between thumb and fingers of right hand a boric sponge is held to cleanse the surrounding parts of the urinary meatus, situated between the labia minora at the vestibule of the vagina, wiping gently towards the vaginal

orifice. Four sponges are used for this purpose, a fresh one for each cleansing stroke. Another sponge is placed over the vaginal orifice.

With right elbow push kidney basin into position between thighs to receive urine. Dip the right hand into the boric solution, then pick up the catheter near its outlet, coil over back of hand, and hold between thumb and finger, about an inch below its eye. Examine eye to see that it is intact, and rotate in lubricant on sterile cotton.

Carefully introduce catheter slightly downward and forward about 2 inches into the urinary meatus, but avoiding the danger of getting it into the vaginal canal. If the catheter comes in contact with any other part than the point of insertion, *i.e.,* the urinary meatus, it should be laid aside and the second catheter should be used.

To make sure that the bladder is completely emptied, the catheter is slightly pushed in, then slightly withdrawn before final removal. When the bladder is emptied, place kidney basin on tray. Double up end of catheter and with the other hand steady it at point of insertion, pinch it and withdraw slowly. Place it in round basin. Dry patient and cover with sheet.

Remove gray blanket, half sheet and rubber. Bed covering and draping sheet are drawn up together and the latter removed. Pull down nightgown and make patient comfortable.

After care of materials

Carry all equipment to lavatory at once. Measure urine; if not to be saved, dispose of it at once. Fold sheet and half sheet and save for the same patient. If clean, the sponge covers are saved.

The catheters are held under cold running water, then washed in hot soap suds, wrapped in gauze, placed in boiling water, and sterilized for five minutes. The water is drained off, the enveloping gauze loosened with sterile forceps, and the catheters turned out upon a sterile dressing towel. Envelop and secure with a clothes pin.

The remainder of the utensils are washed in suds, dried and put away in their respective places. The soiled picked cotton sponges are not saved, but are placed in the bag to be burned.

HOW TO OBTAIN A STERILE CATHETER SPECIMEN

When a sterile specimen is desired it should be discharged from the bladder directly through a sterile catheter into a sterile receptacle, usually a glass test tube, so that nothing outside of the bladder may get into the specimen to contaminate it, and interfere with the true analysis.

Procedure

The same procedures and caution are carried out as in an ordinary catheterization. Besides the usual equipment, one or two sterile test tubes are added, depending upon the amount needed for a specimen. The test tubes are labeled with the patient's name, ward, service, and date, also "sterile specimen," and placed upright in a small retainer close at hand.

Place the kidney basin in position, insert the catheter, holding its outer end coiled over the back of the hand to avoid unsterile contact.

Pinch the middle of the catheter and hold the test tube

in the same hand, until the stopper has been removed with the other hand, to which the tube is exchanged and held, with the stopper. The outer end of the catheter is directed into the test tube without touching its edges, and the pressure upon the catheter with the fingers is sufficiently relaxed to permit the urine to be discharged slowly into the test tube. When nearly filled, the catheter is pinched again, carefully withdrawing the full test tube and again changing it to the other hand, when it is stoppered and replaced in the retainer. If a second test tube is used, the same procedure is repeated.

Finally the end of the catheter is placed in the kidney basin, into which the bladder may complete emptying itself. The patient is cared for and the specimen dispatched to the laboratory for examination.

METHODS OF OBTAINING A STERILE SPECIMEN FROM BABIES

Besides the usual efforts to obtain a specimen, these are sometimes used.

From a male baby

Method No. 1. Use the index finger of a discarded rubber glove and snip off the finger tip. A rubber finger cot may be used in place of the glove finger. Label a glass test tube in the usual way and insert it into the glove finger as far as its rim. Bind the open tip of the finger about the rim of the test tube with narrow adhesive tape.

Gently sponge the urinary meatus with a 2% warm boric solution. Draw the rubber finger tip with test tube attached over the penis and hold in place with narrow

adhesive tape. With a folded towel bolster the test tube on the side of a kidney basin, which will also serve to catch the residual urine. When the specimen has been obtained (usually at once) carefully remove adhesive tape from the penis, and glove finger from test tube. Plug test tube with sterile absorbent cotton and place upright in a retainer.

Method No. 2. Cut a 2½-inch square of adhesive plaster. Make an opening in the middle of this square large enough to permit the introduction of a test tube, which is held in place with a piece of narrow adhesive tape. The adhesive side of the plaster should be uppermost, as by it the test tube is secured about the penis.

From a baby girl

Method No. 1. Tear off four narrow strips of adhesive tape 3 or 4 inches long, and two-thirds of an inch wide. Cut off the thumb and base, or broader part of a discarded rubber glove and snip off the tip of the thumb. Introduce the rim of the test tube through the tip of the thumb and hold in place with adhesive tape.

Preparation of patient

Separate the labia majora and gently sponge the urinary meatus with warm 2% boric solution. Dry the vulva and surrounding parts thoroughly with a sterile sponge, especially the perineum below, so that the adhesive tape will stick.

Application of the test tube

Apply the broad base of the rubber thumb over the patient's vulva and hold in place with a strip of adhesive

tape applied horizontally. The narrow end of the base covers the perineum and is held in place with adhesive tape, otherwise a leakage at that point will cause a loss of the specimen. The two remaining strips are applied to each side of base. The rest of the operation is carried on as in the case of the boy baby, using the kidney basin to support the test tube and to receive the residual urine.

Method No. 2. Use a bird's glass seed dish, the opening of which is placed over the baby's vulva. The base of the dish should rest closely against the perineum and is held in place with adhesive strips and with a firmly applied diaper.

A common resource to obtain a specimen is to support the infant or child, if not too restless, with two small pillows, one supporting the body, the other the legs, between which may be placed a small slipper bedpan. Greater success is assured if this operation is done immediately after a feeding.

CATHETERIZATION IN ABNORMAL URINARY CONDITIONS

Urinary incontinence

Urinary incontinence is an involuntary discharge of urine from the bladder. There is evidence of leakage, yet the bladder is never entirely emptied. This condition is sometimes met in caring for a delirious, unconscious, paralyzed, or mental patient; or in the aged is due to loss of muscular tone of bladder walls.

Retention of urine being the cause in most cases, these patients are usually catheterized at regular intervals of 8 to 10 hours. Some of the more direct causes are growths or stone in the bladder, causing pain and irrita-

tion; and interference with nervous control, following operations on the genito-urinary tract and in spinal fractures with injury to the cord, causing paralysis of the centers which control the bladder.

The latter group are usually kept in a plaster shell with a bi-valve opening, and placed on a Bradford frame, which is elevated sufficiently to introduce a bedpan under its open space, or on an air mattress. The skin about the sacral region should be kept clean and dry by frequent gentle washings of warm, soapy water, and patted dry with a soft towel, followed by inunctions of castor oil mixed to a consistency of molasses, with stearate of zinc powder or with aristol powder, or generous application of melted mutton tallow to make the skin waterproof.

A clean pad should be put under the sacrum to absorb moisture. In ordinary cases where the patient can be moved easily, the patient's back may be elevated on a large air ring to prevent contact with moisture or an oakum pad may be placed on a piece of rubbing sheeting, and slipped under to absorb leakage. The patient's thighs should be supported by a rubber-cased pillow, and a small pillow should be placed under the hollow of the patient's back for greater comfort, if the body is raised from the bed.

Urinary suppression

This condition, in which the kidneys fail to function, is associated with acute nephritis, and may follow operation. Catheterization is done to determine between suspected suppression and a case of retention. This is decided by the amount of urine obtained. If not more than 2 or 3 drams, immediate measures are taken to keep the patient

warm, and fluids forced until further directions are received.

Urinary retention

Urinary retention is a condition in which a patient is unable to empty the bladder normally. Some of the causes are: inactivity of the kidneys, due to irritation following ether anæsthesia; lack of sufficient urine in the bladder to act as a stimulant on its walls; ether paralysis of the urethral sphincters, or spasm; inhibition due to pain following operations on the genito-urinary tract and abdomen; also in conditions of paralysis, mental apathy, or feebleness.

This condition may be found also in newly admitted patients, due to the recumbent position in bed. Foreign bodies in the urethra may cause it. On one known occasion, retention was due to the presence of a renal calculus in the urethral canal.

Signs of retention, as a rule, should be readily recognized (1) by the number of hours since the patient last voided; (2) by the complaint of increasing discomfort and pain, with a sense of fullness of the bladder; (3) by the futile efforts of the patient to empty the bladder. These efforts should be limited to one or two trials, and not more, because of the painful exhaustion attending the condition.

The attitude of the nurse should be one of patience and quiet reassurance, especially in the case of a nervous and apprehensive patient.

If possible the operation of catheterization is avoided and in preference other means are tried for a reasonable length of time. If the patient can bear it, such means as

are here noted have been tried with varied success. Moist heat is more effective than dry heat, and the danger of burning the patient is lessened as stupes are handled.

Protect the bed and apply flannel stupes, wrung out of hot water, over the pubic regions.

Place the patient on a warm douche pan or bedpan and direct warm irrigations over the vulva, using a douche bag or a pitcher. A warm enema is often effective.

Placing the patient on a bedpan containing a little hot water, to which has been added a few drops of oil of turpentine, peppermint, or aromatic spirits of ammonia, is often helpful. When using water in this way the amount should be measured so that, if the patient should void, the amount of water used may be subtracted from the whole, which will give an estimate of the quantity of urine passed.

Results have been obtained reflexly by pouring warm or cool water over the patient's wrist while held over a basin.

There is also the old method of suggestion, by running water from a nearby faucet into a tub or sink, or pouring water at a height from one pitcher into another.

If two or more of these schemes fail, catheterization is resorted to, and the urine saved and measured. The patient may be placed on a régime of forced fluids, in which case a fluid chart is kept until normal urinary conditions are restored.

Over-distention

Over-distention is a condition in which there usually is complete retention of urine and the bladder has exceeded its normal capacity, and its walls fail to contract.

This may be observed by a tumor-like elevation in the region of the pelvis between the umbilicus and the symphysis pubes. The removal of 4 to 8 ounces of urine by hourly catheterization may be ordered until evacuation of the bladder is accomplished. To avoid instrumentation in relieving an over-distended bladder, instead of introducing the catheter every hour, it is left in position and clamped and released at the end of each hour or two until the bladder is emptied, when the catheter is finally removed. The danger of complete removal of urine in an over-distended bladder is its effect upon the circulatory system, shock possibly being caused by the quickly lowered abdominal pressure on the removal of the urine, which has been making back pressure on the kidneys. This condition is seldom met in hospital care of patients, except in newly admitted bed patients where it has been overlooked.

There is also danger of hemorrhage from the bladder walls when distention is rapidly relieved.

METHOD OF PREPARING AN ORDINARY SPECIMEN FOR URINALYSIS

Label a perfectly clean specimen bottle with the patient's full name, ward, service, and date. Sometimes it is necessary to add the time that the specimen was passed and whether it is a single specimen or part of the 24-hour amount.

To prevent decomposition of the urine from exposure to dust and air the mouth of the bottle should be covered. Paper held in place with an elastic band will serve.

The same rule holds for an empty bottle standing overnight for a morning specimen. If not sent to the laboratory at once the specimen should be kept in a cool place.

Specimens for urinalysis should be free from feces, blood, and expectoration and other extraneous substances. Six ounces, at least, is necessary for a full analysis of an ordinary specimen. In special cases a 24-hour amount is necessary.

METHOD OF OBTAINING A CLEAN SPECIMEN

Wash with suds and scald a pint specimen bottle. Label as usual, adding "clean specimen." The mouth of the bottle is covered with a thick sterile sponge, over which is put a paper, held in place by an elastic band.

Wash a bedpan inside and out with hot suds. Scald and rinse and wrap in a clean hopper towel.

The patient is washed locally with soap and water, with sterile sponges, and dried, or may be placed on a douche pan and douched off with a pitcher of hot suds, then with at 2% boric solution or plain warm water, and dried. The douche pan is removed and the patient immediately transferred to the clean bedpan.

When the specimen is obtained it is emptied into the bottle, which is re-covered securely with the clean sterile sponge and paper.

HOW TO SECURE A 24-HOUR AMOUNT OF URINE

This is required when a quantitative test is to be made.

Have the patient void at a specified time, *i.e.*, 7 A.M. Throw away that urine. All subsequent urine passed is measured or saved, according to directions received, including that which is passed at 7 A.M., the following morning.

XXIX

ALCOHOL SPONGE BATH

Purpose

This bath is given chiefly for the sedative effect upon the nervous system; for stimulation to the circulation; to raise the blood pressure; and for reduction of temperature. As a rule it is given every four hours when the patient's temperature reaches a certain point, 102½° F. by mouth or 103° by rectum.

Equipment

2 gray blankets
large rubber sheet
rubber pillow case
patient's towel, 2 if a typhoid patient
gauze sponge
washed gauze
gauze head binder
ice cap
hot water bag
2 basins, one containing bathing solution and water, proportion, 1 to 12, in which the thermometer is kept; the other, a lump of ice about 6 x 6 inches, on which is placed the head binder
bath thermometer

If a typhoid or pneumonia patient, special precautions are taken by the nurse and she wears a rubber apron and

cotton gown with short sleeves, which are added to the equipment.

Procedure

Make sure that all equipment is at bedside before beginning.

Turn upper bedclothes to waist line. Place folded blanket over chest, tucking upper edge over both shoulders. Use lower edge to carry upper bedclothing to foot of bed in three folds as in ordinary bath.

If a typhoid or pneumonia patient, the rubber pillow case is in position, otherwise a rubber case is put on when the cotton case is removed.

Move the patient carefully to the opposite side of the bed. Fold the rubber sheet in two lengthwise with the enameled side out, and place on the bed with its fold next to the patient. Arrange the blanket in the same way and place upon the rubber sheet. Turn the first fold of the blanket over the patient, out of the way, exposing its lower fold upon the upper half of the rubber sheet. Roll both together until the center is reached. Cross hands, firmly grasp the roll top and bottom and turn from head to foot, which will bring the arms parallel and the roll into position against the patient's back, when it is easily slipped under the patient's legs. He is then slowly turned on his side and the remainder of the blanket and rubber sheet are pulled through at his back.

The nurse reaches to the opposite side of bed and smooths out the blanket and rubber sheet, and the patient is now lying on his back between the two blankets. The

under blanket and rubber sheet in position should be as high as the back of the patient's neck.

The nightgown is removed.

Place hot water bag, 125°, at feet, under blanket. Fold head binder and wring out in solution. Bind around head from back to front in turban fashion and place ice cap over it.

If a typhoid patient, wring towel out of solution, double and place over abdomen, and avoid touching abdomen during bath.

Observe three points: the patient's pulse for later comparison; the temperature of the water, which usually starts at 80°, gradually reaching a mean temperature of 70° after the patient's face and arms are done, when he has become accustomed to the lowered temperature; and the time, by the watch. The bath should be of twenty minutes' duration.

The face is bathed first and dried, using washed gauze. With a gauze sponge the solution is applied; one arm is done and then the other, using long soothing strokes downward, followed by brisk, circular friction with the nurse's hands. Procedure is repeated, rubbing until solution has evaporated from skin. Dry with towel, using light friction.

The ice is now put in basin of solution in order to reduce its temperature to 70°, when the ice is removed. This procedure is repeated from time to time throughout the bath, as the solution grows warmer.

The bath is resumed and the order is as follows: the chest, as far as end of sternum; each side, pausing with sponge in axillary spaces; if a typhoid patient, the towel

is wrung out a second time and replaced, otherwise the abdomen is bathed as the remainder of the body; the lower extremities are then done. Fold back upper blanket over each leg separately, so that the thigh is exposed, when the front of each leg is done. Sponging the feet is omitted if they are cold. Instead, dry friction with the hands is sufficient. Blanket is replaced.

Pulse and patient's general condition are again noted. Before turning patient on side, the abdominal towel is changed for the last time, for the typhoid patient. The patient is turned carefully. The back is done to end of sacrum, then blanket is turned back and thighs and back of legs are done.

The bath being now completed, with patient still on his side, the ice cap and head binder are removed and the hair is dried about the neck.

The abdominal towel is removed from the typhoid patient and the hot water bag removed. The blanket and rubber sheet are gathered in smooth folds, pressed under patient and removed from opposite side. The patient is rolled on his back, the outer rubber case is removed from pillow, or cotton case replaced, and nightgown put on.

With lower edge of gray blanket the bedclothes are pulled up and the blanket slipped out, unless the patient is chilly, when it is left and hot water bag refilled, covered, and put at his feet until reaction has set in.

Note patient's pulse and color, also the time, for later observations of the "drop" temperature.

Gather up and put away equipment; if a typhoid case, with the usual precautions.

One-half hour after bath, "drop" temperature and pulse are taken and recorded on chart under the last pulse and temperature taken previous to the bath.

XXX

POULTICES

A poultice is a composition of water and some thickening ingredient, usually meal, which has been boiled until it is of the right consistency to spread on a foundation of cloth or paper for application to the skin when heat and moisture are desired.

As a rule in poulticing, flaxseed meal is used, which is the ground ripe seed of the flax plant. Flaxseed contains a mucilage that is extracted by boiling and gives the poultice a gelatinous consistency capable of holding the air beaten into it to make it light. Flaxseed also contains a fixed oil which helps to retain the heat and moisture for a longer time than any other ingredient used for poulticing.

Purpose

Poultices are often prescribed for the sense of comfort and relief which they afford the patient in deep-seated pain.

They are applied to boils and abscesses to hasten their development preparatory to incision and drainage. They are sometimes used in the place of stupes in gaseous distention of the abdomen when constant heat is desired, and are less disturbing to a very sick patient than the frequent changing of stupes. They are used as a local application for stimulating effect upon the kidneys in conditions of urinary suppression.

FLAXSEED POULTICES

Dimensions of a flaxseed poultice

The poultice should more than cover the affected area by 4 or 5 inches. Poultices applied to the bony thorax and more solid muscular parts of the body may be of greater thickness than those applied to the more tender and sensitive abdomen. As a rule, those for the chest should be ¾ of an inch thick; those for the abdomen, ½ an inch; and those for smaller areas about 1 inch.

Amounts of water and meal

The amount of water needed in making a flaxseed poultice should be in proportion to its size and thickness. These are averages for an adult:

For the chest or abdomen, one quart to five half-pints
For poulticed areas of arm or leg, one pint to one quart
Areas of the face, neck, and finger, 6 to 8 ounces

The amounts of meal that these quantities of water will absorb will be sufficient to cover the affected parts.

Materials which may be used for a foundation

A light weight, pliant, brown wrapping paper is quite satisfactory as a foundation for the larger poultices of the chest and abdomen. Paper is a poor conductor of heat, easy to secure, costs less than cotton cloth, and is easily disposed of with the poultice.

Cheesecloth and sheet wadding as a foundation are better for the smaller poultices, as they are more adapt-

able to smaller parts, like the face or neck, and afford greater comfort. In all cases the covering of a poultice should be thin and porous, so that the affected parts may have the full benefit of heat and moisture.

Frequency of application

Poultices applied to the abdomen and chest should be changed at least every hour; those applied to the limbs, every thirty to forty-five minutes, according to size; those of smaller dimensions, applied to the face or neck every twenty minutes.

Method of holding in place

On the chest or back, a straight binder and shoulder straps are used; on the abdomen, a straight binder and perineal straps; on the limbs, a many-tailed bandage of cotton cloth or a dressing towel applied on the bias; on the hands and feet, a triangular bandage or a dressing

FLAXSEED POULTICE APPLIED TO JAW

towel; on the neck, a dressing towel folded in two, then in bias folds as deep as needed. Folded in this way the towel adjusts itself to the curve of the neck, and is pinned at the side with two safety pins. To give more support to the poultice a piece of flexible cardboard, about 3 by 5 inches, is introduced into the bias fold of the towel against the back of the poultice.

For those applied to the face, as for a carbuncle of the lip, a 6 to 8-inch four-tailed bandage is used, the tails being tied on the side of the head opposite the affected part.

A poultice for a finger is made in the shape of a little bag into which the finger is thrust, and the poultice bandaged on.

An abdominal flaxseed poultice

Equipment

small blanket
binder
perineal straps
safety pins
gauze or thin cheesecloth
sheet wadding
brown wrapping paper
two basins
pint graduate
flaxseed meal
poultice saucepan
poultice board
iron spoon or wooden spatula
vaseline and small spatula
bathing solution

Preparation

Into the poultice saucepan measure one quart or more of hot water, according to size of abdomen; cover. While the water is heating, prepare materials. Cut a piece of medium weight wrapping paper for the foundation, the required size. Fold down the edges 1¼ inches, as a confining border to the poultice. Measure the folded sheet wadding, which should extend slightly beyond the edges of the paper foundation to keep in the heat. In preparing the gauze or cheesecloth covering of the poultice allow a 3-inch margin to tuck under.

If the water has reached the boiling point, remove the cover of the saucepan. Take large pinches of the flaxseed meal. Hold it loosely so that it may run into the boiling water between the fingers, not too rapidly, and at the same time stir constantly to prevent lumping or scorching of the flaxseed. When it has boiled and is of a semi-solid thickness, so that it drops in large clots from the spoon, remove from the fire and add vaseline the size of a pigeon's egg, or two teaspoons of bicarbonate of soda. Stir through the flaxseed thoroughly and then beat vigorously two or three minutes, or until light and smooth.

Turn the flaxseed into the center of the paper foundation. Fill the saucepan with cold water, into which dip the iron spoon to prevent sticking to the flaxseed while spreading. Spread with circular motions of the spoon from the center out to the enclosed edges of the paper. When through, place the spoon in the water. Turn down the edges of the paper upon the flaxseed, then apply the gauze covering, which is drawn taut and tucked under the poultice. Place, with paper side down, upon the sheet

wadding. Both are rolled together and enveloped in a doubled towel, and carried to the patient's bedside in a warm basin, covered with another.

Application

The upper bedclothing is turned down to the pubes. The small blanket is placed over the body, the nightgown folded out of the way, and the binder adjusted under the patient's back. If the poultice is applied for tympanites following operation, the abdomen is lubricated with vaseline or oil because the circulation of the part may be poor and sensation less acute, so that it burns more readily.

Uncover the basin and remove the poultice from the towel. Partly unroll, and with the flaxseed side of the poultice on the back of both hands, gradually transfer to the patient's abdomen, permitting only the edge of the poultice to touch the skin until the patient can bear it. Before pinning the binder it is well to lift the poultice again at each end several times to let more of the steam escape. The binder is pinned rather loosely to avoid pressure on the hot poultice against the skin. The perineal straps are adjusted, the patient covered, and the time noted.

When the poultice is changed, the discarded one is placed in the basin and the moist, poulticed area of the skin is sponged with bathing solution and dried, to prevent maceration. This is done each time the poultice is changed, and is followed with the lubrication of the skin, if sensitive.

Under no conditions should a nurse apply a poultice to the abdomen on her own responsibility.

After care of materials

It is well to wash the utensils before applying the poultice, unless it is a small poultice, when no time should elapse between its completion and its application. As the saucepan has been soaking in cold water, it is easily scraped clean with the spoon, rinsed, and scoured with fine sand soap with the special cloth reserved for this purpose. The spoon receives the same care.

In large poultices the gauze covering is loosened from the surface of the discarded poultice, rinsed in cold water, washed and hung up to dry, to be used next time. The discarded poultice is wrapped in several thicknesses of newspaper, securely tied and placed in a receptacle to be burned.

After care of the skin

When a poultice to the chest or abdomen is finally omitted, the poulticed area is washed gently with soap and hot water, dried, sponged with bathing solution, and covered with a layer of sheet wadding or a piece of flannel, which is held in place with a binder for a few days until the skin is less sensitive.

CHARCOAL AND FLAXSEED POULTICE

Poultices are useful also for softening eczematous encrustations which occur in cases of neglected varicose ulcers or in stimulating the separation of slough in slowly healing wounds, as bedsores. In such cases, if a fetid odor be present, two or three tablespoons of powdered charcoal may be added to a quart of poultice. This acts as a deodorizing agent when applied to the wound. Such poultices are not repeated more than two or three times.

MUSTARD AND FLAXSEED POULTICE

By adding mustard or ginger, the heat of the poultice may be intensified, when desired, for deep-seated pain in the chest, in place of a mustard paste. The proportion of mustard is two tablespoons to a quart poultice. Since ginger is not so irritating as mustard, three tablespoons may be used, added to the poultice batter just before beating by sifting the powdered ingredient over the surface of the poultice, or thoroughly dissolved in a little tepid water before adding. Such poultices are not usually applied more than once, and are removed when the rubefacient stage has been reached.

As a substitute for flaxseed, cereals may be used.

ROLLED OATS AND BRAN POULTICE

rolled oats, two cups (6-oz. cup)
bran, one cup
water, one quart

This quantity would be sufficient for a chest or medium-sized abdominal poultice. When the water reaches the boiling point add the rolled oats and allow to boil. Stir until it begins to thicken, then add bran and continue to stir and let boil slowly. When a little thicker than porridge, turn the poultice onto its paper foundation and arrange as in the flaxseed poultice. Care must be exercised in its application, as this form of poultice is apt to burn the patient more readily than a flaxseed poultice, as the cereal does not absorb the water so completely.

Instead of rolled oats, oatmeal may be used, with the same quantity of bran and water.

POTATO STARCH POULTICE

These poultices are sometimes used in place of flaxseed poultices for softening encrustations of the skin in cases of neglected indolent or varicose ulcers.

Wash four large-sized potatoes, pare as thinly as possible, wash again and grate with a vegetable grater down to the heart. Add one pint of cold water and permit to stand twenty minutes, stirring occasionally to soak out the starch. Strain through a wire strainer into a saucepan. Boil slowly until the potato water has become a thick starch. Cool until it thickens, then spread on cotton cloth, leaving a 2-inch margin to turn over the poultice. Cover the face of the poultice with gauze or thin cheesecloth. Add sheet wadding and parchment paper to the back of the poultice. Apply and hold in place with a dressing towel and safety pins. The bed should be protected. Leave on overnight.

VASELINE APPLICATIONS

Vaseline applications are used to soften hardened or hypertrophied toe nails before clipping, and for the treatment of callouses on the soles of the feet. In either case soak the feet in hot suds for one hour, then apply compress cloth, thickly spread with vaseline, to the affected parts. Cover with sheet wadding and dressing towel to prevent exudation of vaseline. Apply a protective for the bed under the patient's feet and a cradle over them to prevent staining the bed linen. Allow the vaseline poultice to remain a day, remove and soak the feet again in hot suds, when in the case of the nails they may be successfully clipped and filed; if necessary, repeat the

treatment. In the case of callouses, the after treatment would be the application of pumice stone or sand soap with friction, followed with the application of a thin lubrication of vaseline or oil to subdue the irritation which may be produced by the friction.

XXXI

STUPES

Stuping is the application of moist heat to the body at frequent intervals by means of a cloth wrung out of hot or medicated water. These applications are sometimes called fomentations.

The action of the stupe may be increased by adding spirits of turpentine, combined with cottonseed oil to counteract the danger of blistering.

Purpose

Stupes are applied for the relief of tympanites of typhoid fever, pneumonia, peritonitis, and for post-operative distention. Before stuping, to facilitate the escape of intestinal gas, a rectal tube may be inserted to dilate the sphincters ani. The tip of the rectal tube is lubricated before insertion and the other end is placed in a urinal.

Method of making a stupe wringer

The materials needed are:

1 yard heavy crash toweling
2 broom sticks, 14 inches long

Double the toweling end to end and sew together, then sew each end across about 2 inches or more from the folded edge to permit the introduction of the broom

sticks. Sew up one side of the toweling along its length and leave the other side open as a pocket to receive the stupe between its folds.

Abdominal stuping

The bedside table is moved toward the foot of the bed and protected with a rubber cover or newspaper, ready for the materials for stuping. In communicable diseases the nurse wears a special gown.

Equipment

small blanket
half sheet and rubber protector
straight binder with two perineal straps
safety pins
dressing towel
stupe wringer
two flannel pads for stupes, 16 by 11 inches
sheet wadding, two pieces large enough to cover abdomen
absorbent cotton ball applicator
parchment paper
agate pail
medicine cup with turpentine mixture of cottonseed oil, 4 parts; spirits of turpentine, 2 parts
rectal tube and urinal, if needed

Preparation

Arrange materials on table in order of use. Turn back upper clothing to patient's waist line. The patient raises his arms on the pillow out of the way. Place small blanket, doubled, over body. Turn nightgown up over

chest and draw upper bedclothing down to pubes. Under the patient insert half sheet and rubber rolled within the binder so that the half sheet is next to the patient. If the rectal tube is to be used, it is now inserted. Place a piece of sheet wadding large enough to cover the patient's abdomen over the turned back fold of bedclothing. Over the wadding the dressing towel is folded at one end and tucked over the edge of the upper bedclothing as a protective. On the towel is placed a second piece of wadding ready to receive the moist parchment paper later on.

The sticks of the wringer are slipped into place and the wringer spread over the pail. One of the blanket pads or stupes is inserted between the folds of the wringer, and the parchment paper, which is loosely crumpled, is placed on the outside of the wringer. When all is ready a large pitcher of boiling hot water is carried to the bedside and poured over the contents of the wringer until saturated, when the sticks are grasped firmly, held as far apart as possible, and forcibly twisted in opposite directions until there is not a drop of water evident. The parchment paper is placed over the sheet wadding, which is folded over to keep in the heat.

Application

Fold back the blanket sufficiently to expose the abdomen. Saturate the absorbent cotton ball in the turpentine mixture and apply, starting at the umbilicus and covering the right and left upper and lower quadrants of the abdominal surface. Withdraw hot stupe from folds of wringer, shake out, place on back of both hands, and apply carefully to the patient. Cover at once with the sheet wadding containing paper. Raise each end

alternately a few times until the patient can bear the heat. Turn down the blanket over it and prepare another stupe before the first is removed. The interchange of the stupes is made quickly by turning the blanket back over the patient's chest and turning the sheet wadding and paper down together on the towel. The stupe on the patient is picked up in the center with one hand and placed upon the wringer, while at the same time the hot stupe is withdrawn from its folds with the other hand, and with the backs of both hands, applied as in the first place.

Stuping may be kept up for fifteen to twenty minutes out of every hour.

After care of patient

At the end of each twenty minutes, the stupe and sheet wadding, with parchment paper, are removed, and the abdomen gently patted dry with the dressing towel, which has served previously as a protector to bedclothing, and the abdomen is covered with the second piece of sheet wadding. Remove half sheet and rubber. Adjust the binder and do not pin too snugly while distention is evident. Apply perineal straps to hold the binder in place. Pull down nightgown, remove small blanket and readjust bedclothing. As an aid to abdominal relaxation and comfort of patient with distention, support the back of the thighs with a pillow.

After care of materials

The stupe wringer, parchment paper, and sheet wadding are hung up to dry, ready to use again. The stuping flannels are washed in cold water, then in hot soapy water,

after each treatment. The remainder of the turpentine mixture, if any, is tightly covered and used again for the same patient.

Note

The turpentine mixture should not be applied more than twice in 24 hours, to avoid blistering and the danger of absorption. If the urine is smoky in appearance, test for presence of albumin.

Laudanum or tincture of opium stupes

Such stupes are prescribed for their sedative effect. The stupe is wrung out of boiling water and the laudanum is sprinkled evenly over its surface and applied to the abdomen and left on from twenty to thirty minutes. If the patient is not relieved, a second application may be prescribed. Sufficient opium may be absorbed through the skin to produce toxic symptoms. Observe for unusual and increasing drowsiness, pin point pupils, and slowed respiration.

Oil of gaultheria stupes

Oil of gaultheria (wintergreen) contains a volatile oil composed largely of methyl salicylate, a specific for acute rheumatism, and is applied locally to swollen and inflamed joints. There are two methods of application, the wet and dry.

The first is done by applying the oil, followed by application of hot flannel stupes. The joints are stuped in succession for twenty minutes or more, according to number of joints involved. Finally the parts are en-

veloped in absorbent cotton or sheet wadding bandages, which are held in place by a cotton bandage. Instead of a cotton bandage, a dressing towel may be used to save unnecessary motion of winding and unwinding bandages. The bed should be well protected and the patient guarded against exposure during the operation, which may be done every four hours.

By the dry method the oil of gaultheria is applied to the joints with the absorbent cotton applicator, the cotton roller then being put on. Over the cotton roller, cotton bandages are adjusted to prevent fraying of the roller. The oil of gaultheria is applied twice a day.

Sodium bicarbonate applications

Sodium bicarbonate applications are used as an anodyne for the joint inflammation of acute rheumatism. If flannel bandages are used, the soda is rubbed into the bandage and rolled, then bound about the painful joints. The moisture of the patient's body dissolves the soda, some of which is absorbed. A solution may be made of bicarbonate of soda and the bandages wrung out and applied. The urine is tested daily for alkalinity.

XXXII

COUNTERIRRITANTS

Counterirritants are therapeutic agents possessing special irritating qualities when applied to the skin. They are used for the relief of acute and deep-seated pain and congestion.

The action of the counterirritant is felt at its point of application through its stimulation of the sensory nerve endings in the skin. These send the impulse to the transforming nerve centers, thus causing the superficial blood vessels to be dilated; in this way an increased supply of blood is sent to the surface, producing heat and redness, thereby relieving the congested organ or part beneath by lessening the blood supply and tension. The sense of heat and irritation to the skin produced by the counterirritant may also divert the patient's mind from the actual pain.

Counterirritants are classified according to the extent of their action on the skin:

Rubefacients, which redden the skin.

Vesicants, which blister the skin.

Escharotics, which destroy the skin and soft tissue beneath.

RUBEFACIENTS

Rubefacients are as a rule of a volatile nature. They should be closely observed in their action to avoid blister-

ing the skin, which might become infected and cause a deep sloughing wound.

Those commonly used are mustard, tincture of iodine, capsicum or menthol plasters, liniments, cupping, and heat, dry or moist. Heat is more likely to be ordered for the sedative effect.

Mustard plaster

The application of a mustard plaster is a quick and convenient method of applying a rubefacient.

Equipment

mustard plaster
tissue paper
½ yard compress cloth
bowl of tepid water

Preparation

Place the plaster, with the medicated side down, in the bowl of water. Fold compress cloth or small towel a little larger than the plaster, which is placed on the towel, mustard side up. The mustard is covered with the tissue paper, then placed on a folded towel, and applied over the affected part. Leave on for five or ten minutes, or until the skin is a bright red. Plasters are more irritating than mustard paste and need close watching. On removal of the plaster, the skin may be gently wiped with sweet oil or powdered with talcum, and protected from the friction of the clothing by covering the part with a piece of soft linen or muslin. If the area of pain is greater than one plaster can cover, two may be used.

Mustard paste

A mustard paste may be increased or modified in strength by adding more or less mustard or flour as needed.

Equipment

poultice board or paper
compress cloth
dressing towel
scissors
tissue paper
flour
mustard
cottonseed oil
dessert spoon
small mixing bowl
small pitcher of tepid water
hot water bag

In cases when the skin is oily or quick action is desired, a basin of warm soapy water should be added to bathe the patient's skin before applying the paste.

Preparation

The cloth. If the application is for the patient's chest, the cloth is doubled to the desired size (usually 10 x 6½ inches for an adult), allowing one inch in addition for folding over. A cut one inch deep is made on each side of the fold. The cloth is spread open on the board, ready to receive the paste, with one-half hanging over the edge of the board.

The paste

flour, four dessertspoonfuls
mustard, two dessertspoonfuls
cottonseed oil, one dessertspoonful

In the absence of cottonseed oil, olive oil, or white of egg, or bicarbonate of soda may be used.

In preparing the paste for a child, the quantity of mustard would be one teaspoonful to four dessertspoonfuls of flour.

First measure the flour, then the mustard, to avoid washing the spoon. Mix the dry ingredients together; add the oil and mix; next enough tepid water to make of the same consistency as a cake batter.

Completion and application

The paste is scraped out of the bowl into the center of one-half of the compress cloth, and spread with the tip of the spoon in the form of a four-pointed star. Then it is spread between the points, making an even square within an inch of the points. The edges of the cloth are folded over the paste on its three sides, then it is covered with the other half and its three edges turned under. The completed paste is folded in thirds. The dressing towel is doubled lengthwise, then folded in thirds. One end is turned back and the mustard paste deposited upon the thickest part of the towel and adjusted. Pieces of tissue paper should cover the paste, to intervene between it and the skin to prevent blistering. The free end of the towel covers the face of the mustard paste, which is carried to the patient. If the patient is sensitive to cold, the mustard paste may be carried to the bedside upon a warm plate or a hot water bag.

The free end of the towel is folded back from the paste, which is reversed upon the exposed part of the chest. The towel serves to hold the paste in place, to prevent too rapid evaporation of the volatile content, and to protect the patient's clothing.

Observations

The skin under the mustard paste should be observed within ten minutes of application. It may be left on from fifteen to twenty minutes, depending chiefly upon the reaction of the skin to the mustard, and the toleration of the patient. The skin of some persons does not redden to any extent, but is sensitive and may easily blister; that of others develops a bright red blush in ten minutes, but is not especially sensitive.

When a mustard plaster or paste is ordered applied to the face or neck of a patient, special care must be exercised against blistering, which may result in a disfiguring scar, or an unsightly pigmentation of the skin.

Removal of the paste

When the paste is removed, pat the skin dry, oil or powder it, and protect from friction of the clothing.

Substitutes

In place of mustard, ground ginger, capsicum, or any of the pungent spices may be used. Double the quantity of these ingredients is used to the same proportion of flour as in the mustard paste.

Tincture of iodine

Iodine should be kept in a glass-stoppered and glass-labeled bottle. It is highly volatile, and should be fresh

when used, as its strength increases with age. As a counterirritant it is usually ordered at the strength of 7%.

Equipment

bottle of iodine
small glass
camel's hair brush or
absorbent cotton applicator
small piece of compress cloth
2-inch cotton roller
1½-inch cotton bandage, if for an extremity

Carry on a tray to the bedside.

Application

The part to be treated is outlined with cold cream, using the small piece of compress cloth, over the tip of the index finger. Just enough iodine is poured into the small glass. The applicator is dipped into the iodine, which is evenly applied to the skin with the side of the applicator, starting within the margin of the cold cream and working towards the center with circular strokes. A single coat of iodine is usually enough; when it has dried the cotton roller is applied for comfort, and over that the cotton bandage to hold it in place and for slight pressure when there is swelling. If the iodine is applied to the body, a sheet of wadding and binder are necessary, adjusted loosely so as to permit some evaporation and avoid blistering the skin. If the iodine burns more than it should, it is at once washed off with ether or alcohol. Ammonia water removes the stains from cotton material.

Disposal of materials

If an applicator has been used, it is thrown away. If a camel's hair brush, it is cleaned in ether or alcohol, ready for use again. The glass should be wiped with ether or alcohol, then washed with soap and water.

Liniments

Liniments are preparations of several liquid volatile substances, with an oily base, for application to the skin. Because of the slight counterirritation and relief which they afford, especially if applied with brisk rubbing, or friction by the nurse's hand, if the patient can bear it, they are sometimes prescribed in muscle strain and painful affections of the joints. The treatment is followed by the application of a flannel bandage or a sheet wadding roller.

Commercial plasters

Those used as mild counterirritants are medicated preparations, as of capsicum, menthol or belladonna, made to adhere to the skin. The drugs are incorporated in a base of tar and spread on cotton cloth by means of hot rollers. The plasters are usually perforated to permit evaporation of moisture from the skin, and are called porous plasters.

They are occasionally used for deep-seated pain and for relief of muscular strains of the back. The part to which the plaster is to be applied is washed with soap and hot water, then dried thoroughly. The plaster is slightly warmed and the strips of cloth covering it are removed before applying. If applied to the lumbar region, the patient should first bend slightly forward from the hips,

so that he may assume the upright position free from the discomfort of the restraint of the plaster.

Dry cupping

Dry cupping is a mechanical method of producing a circumscribed hyperemia of the skin over the affected part, for the relief of congested organs, as the lungs in pneumonia, the kidneys in nephritis, where suppression may be present, or for the evacuation of deep abscesses.

Two methods are employed in the operation of cupping; one exhausts the air in the cupping glasses by means of a rubber bulb attachment like that of a breast pump. As the air is pumped out of the glass a partial vacuum is made into which the skin is sucked, causing it to balloon under the glass and the superficial blood vessels to dilate. In the second method, an alcohol flame is used to heat the air in the glass, when a partial vacuum is obtained through air expansion. In this method, if cupping glasses are not available, ordinary 4 or 5-ounce glasses, with smooth edges, may be used.

Equipment

deep tray containing
cupping glasses, four or five, according to surface to be cupped
spirit lamp
matches
alcohol, 95%
small glass
orange wood stick with pointed end
basin with soap and water
package of sterile gauze
blanket

Arrangement of materials at bedside

The operation of cupping calls for a clear head and a deft and steady hand. The bedside table on which the materials are placed, and the screen, if one is used, should be so arranged as to give plenty of room to avoid danger of fire. If the cupping is to cover a large area of the body, the patient and bed should be protected with a blanket, and the patient reassured if he is apprehensive of being burned.

Procedure

The part to be cupped is cleaned with soap, warm water, and sterile gauze, and then is thoroughly dried. Pour a half ounce of alcohol into the glass, and moisten the point of the orange stick in the alcohol. Over the point twist a piece of absorbent cotton, making a medium-sized swab. Light the spirit lamp, dip the swab in the alcohol, and press it against the side of the glass to squeeze out the excess alcohol. Pick up a cupping glass in one hand and invert; ignite the swab in the other hand and quickly sweep the inside of the cupping glass with the blazing swab, avoiding its edges. This sets the glass on fire, when it is quickly applied over the affected part while still flaming. The flame is extinguished on shutting out the air. The remaining glasses should follow in quick succession until the area to be cupped is covered. The swab should be dipped in the alcohol following the application of every second cup. This prevents charring the swab and overheating the cupping glass.

Removal of cupping glasses

In two or three minutes, when the skin under the cups shows signs of deep redness, the skin at the margin of

the glass is pressed down, when the air rushes in and the glass is readily removed.

A cup, if permitted to remain overtime, may produce a bruise-like discoloration due to the rupture of the thin capillary walls by the suction of the cupping glass.

VESICANTS

Vesicants are agents used to produce a circumscribed blister. They are applied chiefly for the relief of pressure from effusions in a joint, as in acute synovitis.

Cantharides, the agent commonly used, is prepared from the dried and powdered bodies of the Cantharis or blister beetle, better known as Spanish fly, from which are made for external application a collodion, a cerate, and a plaster.

Before applying a vesicant, the skin is shaved if necessary, cleaned with soap and hot water, and finally with corrosive alcohol, using sterile sponges for scrubbing and drying the skin. This is done to prevent infection from the subsequent broken skin.

Cantharidal collodion

The skin is prepared as in the application of all vesicants. The affected part is outlined with boric acid ointment, painted with the collodion and protected with a sterile sponge over which a loose bandage is applied. This is left until a blister appears, which may not be for 6 or 8 hours. The collodion about the margin of the blister is carefully removed with alcohol or ether. The blister is then snipped at its lower edge with a pair of sterile scissors, and its contents caught in a sterile sponge pressed against the opening. When it is empty

a sterile sponge thickly spread with boric acid ointment to prevent sticking is applied and held in place with a comfortable bandage. This dressing may be changed daily until the blister is healed.

Cantharidal cerate

A piece of sterile cotton cloth cut the size ordered for the part to be blistered is spread with the cerate and covered with a sterile sponge, the edges of which may be held in place with narrow strips of adhesive tape just tight enough to hold the sponge in place and loose enough to permit a blister to rise. The cerate is usually slower in action than the collodion.

Cantharidal plaster

The size of the plaster ordered is seldom larger than 2 x 2 inches. Following the preparation of the skin, sweet oil is applied to its surface or to the face of the plaster, which is held in place as in the other cases, avoiding pressure. If a blister is not evident in 6 or 8 hours, to hasten its development, especially where the skin may be thick, as over the knee, moist heat is applied in the form of a small flaxseed poultice or sterile sponges wrung out of hot sterile water. The usual careful treatment of the blister is carried out.

Certain observations should be made in the use of cantharides and reported, as enough may be absorbed into the circulation to cause irritation of the urinary system. The patient may complain of pain, and difficulty in voiding urine (strangury). The urine may present a smoky appearance, and if so, a specimen should be saved for analysis.

Ammonia and chloroform

Ammonia water may be used as a vesicant. Secure a large-sized thimble and pack a little absorbent cotton into its tip. Then pour a few drops of ammonia into the thimble and invert over the part to be blistered.

Chloroform may be applied for the same purpose.

Leeching

The medicinal leech has a prehensile disk at each extremity by means of which locomotion is produced by lengthening and shortening its body. The leech attaches itself at each end to the patient's body while abstracting blood. Its mouth is in the anterior disk.

Leeches are used for the relief of acute local inflammations, especially those of the eye and ear, and have been used on other parts of the body for deep-seated congestion in place of wet cupping. For application a leech is placed in a wide-mouthed bottle.

Application

The exact point prescribed at which the leech is to be applied is cleaned with a sterile sponge, unscented soap and hot water, then wiped with a dry sterile sponge. In applications to the face where the contact of the leech is disagreeable to the patient, a double piece of sterile gauze may be used in which one or more small openings may be cut opposite the points to be leeched, through which the leech may bite. The patient's ears should be plugged with absorbent cotton or a towel bound snugly over both ears and pinned on the top of the head. A second towel should be pinned firmly about the patient's neck and

tucked over his shoulders. These precautions are taken in case the leech escapes.

In applying the leech the direction in which it is headed is noted, usually towards the mouth of the bottle; if not, the bottle should be shaken until the leech heads outward. The cork is partly removed from the bottle, the water drained off and the mouth of the bottle quickly inverted over the point to be treated. The bottle is held in place and the leech attaches itself to the patient's skin, where it usually remains until engorged with blood, when it rolls off. If to be applied to a part for a limited time, salt is sprinkled on the leech in order to detach it. If more than one leech is applied, the patient's pulse should be watched for quality and rate, to avoid overbleeding. Keep the leech out of sight if possible.

After removal the bleeding points are treated with antiseptic precautions and a sterile dressing is applied. If bleeding is persistent, report.

Leeches are usually disposed of by burning or burying.

ESCHAROTICS

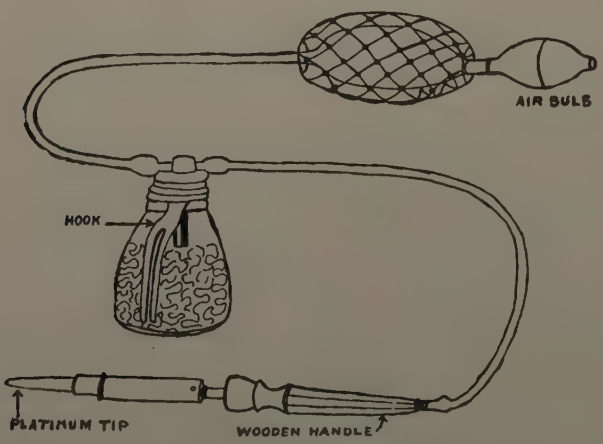
The term escharotic is rarely heard in the present day; nevertheless such agents are frequently used for the destruction of morbid tissue and the removal of abnormal growths in the skin, by burning or corroding.

For the application of heat the thermo-cautery is used, especially where large surfaces of the skin must be treated, as in cases of congenital angiomata, disfiguring pigmentations of the skin and cancerous growths. The thermo-cautery acts more quickly and the degree of appli-

cation desired can be better controlled than in the use of chemical caustics.

Thermo-Cautery

A thermo-cautery consists of a hollow platinum tip screwed into a wooden handle which is attached to a rubber tubing and connected with a T-shaped tube that fits into a metal cap and screws into the lamp. Attached to the opposite or right side of the T is an extension of rubber tubing, on the end of which is a rubber bulb enclosed in a mesh covering. Within the lamp is a small piece of sea sponge or lamb's wool, which is saturated with benzine. It is important that only enough benzine to saturate the wool is used. At the side of the lamp is a metal hook for suspension on the belt of the operator's gown.



THERMO-CAUTERY

The spirit lamp is lighted, and the platinum tip is heated in the flame. The fumes of benzine are slowly forced from the lamp into the platinum tip by pressure on the bulb until the tip is a red or white heat, as desired. If the operation is a long one, gentle pressure is made on the bulb at short intervals to keep the tip at constant heat. When the thermo-cautery is used in surgery, the assistant operating the bulb stands as far away from the anæsthetizer as possible, to prevent an explosion due to the heat of the cautery and the inflammable nature of anæsthetics.

On completion of the operation by the doctor, the nurse takes charge of the cautery, which is still hot, and if it is not possible to attend to it at once, she is careful to place it in a fireproof receptacle, with the tip pointed upwards until ready to care for it. There are two reasons for these precautions: first, the danger of fire if the tip is placed near inflammable material and second, because of its delicate mechanism; if any pressure is brought to bear on the tip it is easily dented and damaged beyond repair.

If the platinum tip has been used upon live tissue, the only way to clean it is to burn the adherent tissue off in a flame. When cool the tip is carefully wiped with a sponge and put away.

The more modern thermo-cautery is attached to an electric plug in the wall. It is manipulated by pressure on a thermostat which controls the amount of heat desired.

Following this treatment, if severe, the skin and underlying tissues slough, and are gradually replaced by new granulating tissue. In several weeks skin grafting is usually done.

Caustics

Chemical caustics are applied for the treatment of small blemishes of the skin, for the removal of warts, which are hypertrophied papilla of the skin, and corns, which are hypertrophied layers of skin caused by pressure.

In using caustics, the area of the skin around the part to be treated should be protected.

The acid caustics are more commonly used than the alkali. Some of these are:

glacial acetic acid
nitric acid
carbolic acid, 95%
trichloracetic acid
acid nitrous of mercury
carbon dioxide snow
lunar caustic pencils, which are kept with their tips imbedded in flaxseed in a wide, shallow-mouthed bottle to keep dry.

XXXIII

INHALATIONS AND CROUP TENT

Inhalation affords a means of treatment for certain affections of the respiratory and circulatory systems. For such treatment preparations of a volatile nature are used, as gas, the vapor of volatile drugs, or plain steam. Certain drugs are volatilized in boiling water, others give off the vapor by burning.

GAS

Oxygen

Oxygen is used in emergency for treatment of sudden heart failure, shock, gas or chloroform poisoning, and in pneumonia and dyspnœa or any other conditions in which there is cyanosis.

This gas can be made in several ways. One is by heating potassium chlorate and manganese dioxide together, which releases the oxygen. It is furnished in steel cylinders, under pressure, and is given to the patient directly from the cylinder. Before the oxygen can be used, the cylinder is fitted out with a wide-mouthed 10-ounce bottle, half filled with water, the cork perforated by two bent glass tubes, one longer than the other. The longer tube dips under the water, the shorter projects below the cork about an inch. A 10-inch piece of rubber tubing connects the escape valve of the cylinder with the longer glass tube. The outer end of the shorter tube is con-

nected with an inhaler or mask by a 3-foot piece of tubing.

Method of administration

The oxygen is turned on slowly by means of a stop-cock, permitting the gas to pass through the short rubber tubing into the longer glass tube, under water, which helps to moisten the gas. From the water the gas escapes through the shorter glass tube and longer rubber tubing to the inhaler, from which the patient inhales it. The size of the bubbles in the water indicates the pressure of the oxygen, which should be regulated to run rather slowly, making small bubbles.

In certain emergencies, as gas poisoning, the closed method of giving oxygen is sometimes used. The end of the long rubber tubing connected with the bottle is introduced through the tip of the cardboard ether cone as far as its mouthpiece, and the cone is then placed over the patient's face and the oxygen is turned on. A gag is sometimes used to hold the patient's jaws apart.

In other conditions of unconsciousness the oxygen may be administered by means of a small rubber catheter introduced into the naso-pharynx. This method is the most efficient of any.

Points to be noted

An oxygen tank should be in readiness at all times.

The inhaler should always be attached to the longer piece of tubing, otherwise the force of the gas will drive the contents of the bottle into the patient's face.

Do not crowd the inhaler over a patient's face.

Inhaler and tubing should be sterilized before using on a second patient.

The valve of the cylinder should be closed tight when not in use, to prevent escape of gas.

VOLATILE DRUGS

Amyl nitrate

This drug is a vaso-dilator and a muscle depressant; it acts upon the walls of the arteries and bronchi, causing them to relax. It is given in angina pectoris and in the paroxysms of dyspnœa and in asthma. If given properly it acts instantaneously.

The drug is confined in covered glass ampules containing 3-5 minims. It is administered by first breaking the ampule within the folds of a gauze sponge, or small towel, which is held near the patient's nostrils. Inhalation should be slow, with the mouth closed.

After inhalation it produces a sense of fullness of head or sharp headache, flushing of face, and increased heart action and respiration for a short time. An overdose will produce cyanosis, cold clammy skin, irregular respiration, and death from paralysis of the heart. After inhalation the patient should be closely observed.

Other drugs

Aromatic spirits of ammonia and smelling salts may be inhaled from the receptacles in which they are held. They are used in faintness as respiratory stimulants.

Ammonia gas is sometimes used as a stimulant in extreme conditions, as heart failure. It is very pungent and irritating to the eyes, which should be protected.

STEAM INHALATIONS

Steam inhalations are used especially for local treatment in acute nasal or bronchial affections. The medium is boiling water into which may be introduced a drug, ordered for the purpose, whose medicinal properties may be antiseptic, or antispasmodic, and stimulating. The drug should be thoroughly mixed with the boiling water and the steam inhaled.

For these conditions some of the drugs given are compound tincture of benzoin, oil of eucalyptus, menthol, thymol, and spirits of camphor.

This treatment is best at bedtime, following a hot bath.

Improvised method of giving a steam inhalation

In the absence of a special inhaler or atomizer, one may easily use improvised methods with good results. The necessary equipment includes a strong paper bag, large enough to hold a three-pint pitcher, with the narrow side cut out to fit under the patient's chin and permit the introduction of his face into the bag close to the rising steam; a three-pint pitcher of boiling water; and an enamel basin.

PATIENT TAKING A STEAM INHALATION

The pitcher is first put into the paper bag. The drug is measured, turned into the boiling water in the pitcher, stirred, and the mouth of the paper bag rolled tight to keep in the steam. It is then carried in the basin to the bedside. The patient is instructed to place his face in the bag over the pitcher, at the same time fitting the bag round his face to prevent escape of the steam. A small blanket or turkish towel thrown over his head will still further serve this purpose.

If compound tincture of benzoin is used, it should be stirred at intervals with a wooden spatula to break up the film which forms on the surface and allow the steam to escape.

Following the use of benzoin, alcohol or ether will remove the gummy deposit in cleansing utensils.

A CROUP TENT

This treatment is sometimes ordered for croup in children, in cases of bronchial colds, and following operations on the throat. It may be kept up indefinitely until relief is obtained.

Equipment

screen, three-folded
heavy cord
safety pins
gray blanket
two sheets

Procedure

The blanket is spread over the top of the screen, hanging down 10 inches in front and evenly at the sides. The corners are squared with the screen and pinned. The

first sheet covers the blanket and falls over in front about 10 inches and over one side of the screen. The second sheet is folded lengthwise and applied to the remaining side and back. It is pinned at the top along its folded edges, meeting the first sheet at the back corner of the screen, where an opening is made for the introduction of the spout of the croup kettle.

Great care should be exercised to prevent fire from the alcohol lamp, which should be surrounded with a metal screen, and the patient should be far enough removed from direct steam to prevent being scalded. An electric plate may be used instead of an alcohol lamp.

DRY INHALATIONS

In such inhalations the drug, which is in dry form, is ignited and produces a smoky vapor. This is used as an antispasmodic in treatment of asthma, either bronchial or cardiac.

Stramonium in leaf or powder form may be ordered, combined with potassium nitrate. The leaves are usually

1 2 3

1. Pitcher within the paper bag in position for a steam inhalation.
2. Paper bag inverted over a bowl for dry inhalation.
3. When the patient cannot sit up he may take the steam inhalation through a window cut in the side of the paper.

PAPER BAGS CUT FOR INHALATIONS

smoked in a clay pipe or made into cigarettes. The pulverized form is ignited and inhaled.

For this purpose a bowl and paper bag are used. Even the top of the bag with the scissors and cut an oval hole in the bottom for the introduction of nose and mouth. In the bowl is placed one teaspoonful of stramonium, which is ignited. As it smoulders the bag is inverted over the bowl and all is carried to bedside in an enamel basin.

The patient holds the basin between his knees and is instructed to hold his nose and mouth over the opening in the bag, and inhale until relief is obtained.

Treatment may be repeated as often as necessary, but relief should be obtained in one-half hour.

Sometimes medicated papers are burned which have first been soaked in the solution of the drug and dried. Potassium nitrate or sodium nitrate are administered in this way and are called niter papers.

XXXIV

COLONIC IRRIGATION

A colonic irrigation is a slow and continuous inflow and outflow of a fluid into the colon by way of the rectum, a douche bag or douche pail serving as a reservoir for the solution.

Purpose

Irrigations are prescribed for local and systemic treatment. Locally they are sometimes given for relief of flatus, for disinfection and cleansing of the colon in ulcerative colitis, in mucous colitis, constipation, diarrhea, and inflammation of the cecum.

They are prescribed for systemic absorption of water or saline fluids in certain cases in which the patient's tissues have lost a large amount of fluid, as in hemorrhages, shock, vomiting and diarrhea; or in cases when fluid cannot be tolerated by mouth.

Preparations which may be ordered

Local. For local treatment the irrigations most commonly used are sterile saline solutions or 2-3% solutions of nitrate of silver.

Systemic. In forcing fluids for systemic absorption irrigations of plain tap water or 0.6 saline solutions are used.

In mercurial poisoning potassium acetate is sometimes prescribed in proportions of one ounce to a gallon of water, for its diuretic action.

Equipment

blanket
half sheet and rubber protector
hopper towel
bath thermometer
douche bag or douche pail, rubber tubing with a metal clamp and glass pipette or glass connecting tube to which is attached catheter (Am. No. 10 or No. 12) for inflow. Around the catheter should be a narrow strip of adhesive tape, 3 inches below the eye to serve as a marker.
rubber rectal tube (Am. No. 22) with a catheter eye and glass connecting tube to which is attached 18 inches of rubber tubing for outflow. Seven inches from catheter eye of rectal tube is also a narrow adhesive strip to serve as a marker.
lubricant
small rubber sheet
slop jar or pail
prescribed solution

Procedure

In place of a Kelly pad, a trough may be made by rolling the edges of a small oblong piece of rubber sheeting on each side towards its center, leaving a foot-wide space for the escape of fluid into a receptacle below. Each rolled edge is held in place by a small safety pin on the under side.

Prepare solution in receptacle, and cover to keep in heat. Suspend 2 feet above patient.

Preparation of patient

Remove one pillow.

Turn back upper bedclothing to waist.

Protect patient with extra blanket; half sheet and rubber arranged as for an enema; patient usually placed on the left side with head lower than the hips, which may be raised by a pillow, and the upper knee flexed.

Place rubber trough under hips for drainage into the jar at side of bed.

Drape hips with hopper towel under blanket.

Operation

Temperature of the solution is 110°–115° F., unless otherwise ordered. The purpose of the treatment determines the quantity. If given for absorption, ½ to 2 gallons of saline solution or sterile water is ordered; if a medicated fluid, the quantity may be less and may be preceded with a large saline irrigation, to cleanse the colon of mucus.

Allow sufficient fluid to run through inflow catheter to expel air and equalize temperature of water in tubing, then shut off. Lubricate catheter and rectal tube and introduce together into anus, as one. Slowly withdraw the catheter and push in the rectal tube until the two adhesive strips are on a level just outside the anus.

Release snap and allow the solution to flow.

Cover patient and carry on the irrigation.

When irrigation is completed, clamp tubing and withdraw inflow catheter first, then larger rectal tube.

Dry patient and rearrange bed for comfort.

An interrupted method of giving the irrigation is sometimes used, by clamping or pinching the outflow tube and permitting the inflow to continue until the colon is filled, or to the extent of toleration by the patient. The inflow tube is clamped when the outflow is released. This method may be used in constipation or other local affections of the colon to insure more complete cleansing.

Observations

Flatus is shown by bubbles in the glass tube as the solution flows out into the pail.

Observe washings for mucus and blood, and report results.

For local treatment this may be given twice a day, or for systemic treatment it may be continuous as prescribed.

Obstructions of the outflow tube may be caused by small fecal masses. In such cases it is necessary to remove the rectal tube and clear it out.

The use of one tube

In the absence of the double rectal tubes for flushing out the colon a single rectal tube and funnel may be used with good results. Insert the rectal tube and pour the solution in slowly, one pint or more at a time.

The patient is persuaded to hold the solution a minute or two, then it is drained off through the tube into a receptacle on the floor. The operation is repeated until the prescribed amount of solution has been used or until it runs clear.

Metal tubes for irrigations

In place of the rectal tube and catheter, a metal irrigating tube may be used. These tubes are simple in construction and easily manipulated. They are planned to work on the same principle as an intra-uterine douche nozzle with a return flow. They are made up with an inflow and outflow tube all in one. The connection of the rubber tubing is on the same principle as the catheter and rectal tube, as described on page 225.

The metal irrigator should be lubricated before insertion, being careful not to plug up the perforations, as this would obstruct the return flow.

Before inserting, allow the solution to run long enough to warm the irrigator slightly, as well as to expel air.

In cleansing the irrigator before putting away, the inner tube, which is detachable, should be unscrewed and removed, and all washed in cold water, scrubbed with soap and hot water, and sterilized.

Rubber tubes are preferred in most cases because of their flexibility.

COLONIC IRRIGATION FOR INFANTS

Solutions

The solutions generally used are saline, 0.6 salt solution, sodium bicarbonate, 120 grains to 1 quart, or tap water.

Equipment

ordinary table
low chair

tub or pail
soft rubber catheter
agate irrigating can
glass connecting tube
rectal lubricant
hopper towel
half sheet and rubber protector

Procedure

Not less than two quarts of solution should be used for systemic absorption.

Not more than one irrigation should be given in 24 hours.

The temperature of solution is 105° F. unless otherwise ordered. The size catheter is No. 18–13 Am., depending on the size of the baby.

Prepare the solution in the irrigating can and attach the catheter with glass connecting tube. Bring to the bedside with the tub, half sheet and rubber, and rectal lubricant; cover with the hopper towel.

Place low chair before table, facing it, with the tub on the floor between the chair and table. The nurse sits in the chair with the half sheet and rubber over her lap, one end of the rubber extending down as a trough into the tub or pail.

The baby's clothes must be well turned back, exposing the buttocks. It is best to roll a small blanket around him, thus securing his arms, as he is apt to struggle. He is placed across the nurse's lap with the buttocks extending beyond her knees over the tub.

Lubricate the catheter. Let a little solution run through the tube to get out the air. With the left hand, hold the baby's legs, so that the buttocks are slightly elevated. With the right hand insert the catheter about 12 to 14 inches into the rectum. If water is allowed to flow during insertion of tube, it will dilate the colon, preventing the tube from doubling back on itself, preventing any forcing of the tube against the intestinal wall. There is no danger in inserting the tube this distance if the water is allowed to flow ahead of it.

The irrigating can should not be more than 2 feet above the level of the baby. Let the fluid run in till the abdomen is slightly distended, then allow it to run out, and so on until the water returns clear. Gentle massage of the abdomen facilitates the reaching of the fluid to the upper part of the colon. If the object of the irrigation is to cleanse the colon, enough liquid should be used to do this whether it is much or little.

The connecting tube is detached after the irrigation, the catheter remaining in for a few minutes until all the fluid possible is drained off.

XXXV

ADMISSION OF PATIENTS

In a general hospital there are different avenues of admission which are governed by the patient's physical condition.

Front door admissions. So-called "front door" admissions are those who have been recommended to the hospital by their family physician, who, as a rule, makes arrangements by telephone for the entrance of the patient as soon as a bed can be secured. Such cases are, generally, not so ill as to need immediate hospital attention, and later formally enter at a definite time through the admitting office.

Emergencies, medical, surgical, and recent accidents, are admitted at all hours, and are never turned away.

Ambulance cases may also be emergency cases, but are frequently those who have been ill at home, and are unable to walk. These are generally called "front door" admissions, as previous official arrangements have been made before entering the hospital.

FRONT DOOR ADMISSIONS

Routine care of patient on admission

A front door admission usually walks into the ward with a messenger who brings the patient's yellow slip and name card. Cardiac patients are brought to the ward in a wheel chair.

The patient is met by the head nurse, or by any nurse who is at hand, so that he may have immediate attention. Be as courteous as though you were receiving a guest in your own home. The first impression a patient receives is seldom forgotten.

Take the temperature, pulse, and respiration at once and record on the yellow slip for the time being. The chart will come from the Treadwell medical library the day of admission, with top filled out in typewriting, and the temperature, pulse, and respiration are noted, to be copied later in their proper places on the chart. Patient may be asked if he has been in bed at home or before admission, duration of illness, symptoms, and, according to the time of day, if he has had dinner or supper.

Notify at once the house officer who is in charge of the ward at that time. He can be reached by telephone. Give name of admission; for example, John Doe: diagnosis, right inguinal hernia; also the temperature, pulse, and respiration. If the patient has not had a meal, ask what he may have. The house officer often asks about the patient's general condition at this time.

The nurse in charge assigns the patient to a bed, and decides if he may have a tub bath. If temperature is over 100° F. or subnormal, or if the pulse is weak and rapid, the routine is generally a bed bath.

The tub bath

If the patient is permitted to have a tub bath the water is drawn by the nurse. The tub should be not more than half full, at a temperature of 100° F. Instead of a bath mat, newspapers may be spread on the floor at the side

of the tub. On a chair nearby should be towels, face cloth, soap, nail brush. In addition to toilet articles, nightgown, wrapper, stockings and slippers should be laid out for a woman; pyjamas, wrapper, socks and slippers for a man. On the floor, in both cases, should be spread a clean cotton square upon which is placed temporarily the clothing of the patient, carefully folded, to be tagged later.

The nurse renders what assistance is necessary, according to the patient's condition and age. In the case of a male patient, the orderly aids him. The patient, if feeble, should be assisted into and out of the tub. The nurse or orderly may help with the bath and at the same time should closely observe the skin for any unusual condition, such as minute hemorrhagic spots or scratches that would indicate the presence of pediculi and would call for thorough inspection of clothing and body, with treatment of both according to special directions.

It frequently happens that the patient may be admitted to a surgical ward for a minor operation, and is otherwise fairly well and strong. In such cases the patient may prefer the privacy of the bathroom in taking his bath. With a woman patient the nurse should attend to all needs and, as in the first case, offer assistance, or if not needed she should see that the tub is securely curtained before leaving, and tell the patient that she will be within call. Having the patient in mind, she should look in on her in time to assist her in dressing, and observe the condition of the bath water before it is allowed to run out, also to scrutinize the patient, without attracting attention, and note whether or not she is clean.

When through with the bath, if patients are to remain up, they are in ward clothes. They are shown the toilet and where drinking water may be obtained. Men are told that they must not smoke without the doctor's permission, and then they must smoke outside.

They are then guided to the ward and comfortably seated by the bedside, or put to bed if necessary.

All medical cases are put to bed on admission until ordered otherwise. They should be weighed when possible.

At this time if the patients in neighboring beds are not too ill they may be informally introduced to each other. It is sometimes possible to place together the beds of foreign patients who are of the same nationality.

The hair

A woman patient is supposed to wear her hair in braids, as it will prove to be more comfortable, and the hair is less likely to snarl. While the nurse attends to this she will be given the opportunity to observe the condition of the hair, when, if necessary, immediate treatment will be tactfully suggested and carried out as if it were a mere matter of routine, so that the patient may in no way feel sensitive.

In the case of a male patient or a child, the same treatment should be carried on. See Chapters XVI, XVII, and XVIII.

The patient's clothing

Private patients are allowed to keep and wear their own clothes and sign a slip to this effect. Otherwise clothes are tagged with patient's full name, listed cor-

rectly on Clothes Slips, signed by nurse and patient, and taken with slips to the General Locker Room, where the slips are verified and a locker number is put on the slips, one of which is taken back and kept on the chart rack.

If the patient is on a special ward, such as the skin ward, the clothes are tagged as usual, hung up enclosed in cotton covers, and number of locker put on slip. Clothes Slips have to be made out for these also.

Soiled clothing, with the exception of woolen articles which are sent to the clothes room, must be sent home if possible, or be marked with a cotton tag on which is printed in indelible ink the name of the patient and the ward, and sent to the laundry.

Clothing of precaution cases is tagged, fumigated, and placed in the General Locker.

Care of personal property

Valuables, with the exception of $1.00, are given at once to the nurse in charge, who is responsible for them. They are listed on the Clothes Slip, under the proper heading, and signed for by the patient and the nurse. They are put in an envelope and listed on the outside, with the date, ward, and name of the patient. They are then taken as soon as possible to the Cashier's office, where they are to be kept. They are signed for on the Valuables Slip which is returned to the nurse, and finally after five o'clock the head nurse checks valuables with the admitting superintendent, who places them in the safe in the office.

No one is allowed to keep valuables except at his own risk, when a Responsibility Slip for such articles has to be signed by the patient.

EMERGENCY WARD ADMISSIONS

In such cases the ward will be notified by telephone so that the bed may be ready. These cases are reported to the house officer in charge of the ward, although the patient has been seen by some one in the Emergency Ward. The clothes and valuables are listed in the Emergency Ward, and *only* the listed and signed Clothes Slip comes with the patient.

If no special orders come with the patient, he is given bed bath and *liquids without milk* until further order.

AMBULANCE CASES

Such ambulance cases as are front door admissions are reported to the house officer.

These patients are generally so ill that the bath is given in bed.

Bed bath

Turn down the bedclothing; at the same time add the bath blanket, and if in the cool season, a hot water bag. When the details of admission have been attended to and the patient has rested for a little while, he will be ready for the bath, which is carried out as in the ordinary bed bath with the usual observations of head and body. Any burns or pressure sores or any other unusual condition should be reported to the head nurse, who in turn reports in writing to the superintendent of the training school.

MEDICO LEGAL CASES

These are industrial accidents, burns, fractures, etc. Clothes should be folded compactly, with as little dis-

turbance to their actual condition as possible, and made into a bundle. This bundle must not be removed from the ward or room in which the patient is until 12 hours have elapsed since the patient was brought to the hospital, when this bundle, properly tagged, may be sent to the General Locker Room. If the patient should die within 12 hours, the clothing goes to the morgue.

XXXVI

PHYSICAL EXAMINATION

On entrance to the ward all patients have a bath before physical examination unless their condition does not permit.

As a rule the patient's physical history is taken first by the doctor and followed with the physical examination. Other special examinations may be done later. If the patient is a woman, the nurse is always present and assists the doctor.

Equipment

large gray blanket
shoulder blanket
dressing towel
kidney basin
sphygmomanometer

The doctor usually carries with him:

stethoscope
tape measure
blood pipette
wooden tongue depressors
flashlight
reflex hammer
ear speculum

Preparation of patient

If an open ward, screen the bed carefully and see that the patient is not directly exposed to an open window during the examination. If it is the first time the patient has been in a hospital, explain to her, if possible, in a brief but reassuring manner, what is going to be done, and its relation to her welfare. Besides being kind, this may help in getting better coöperation from the patient if she is timid.

Loosen the upper bedclothing at both sides and turn back at the waist. Apply the gray blanket as in a bath, carry the bedclothing to the extreme foot of the bed, and arrange in small folds. The patient is now lying under the blanket. Remove her nightgown and replace with the shoulder blanket, loosely pinned at her neck in front.

General survey

The first steps in the examination may be a general survey of the patient's physical development, the skin and mucous membranes, followed with inspection of the ears, nose, mouth, neck and lymph nodes.

The chest

If the patient is able, she is assisted to sit up in bed. She should be comfortably balanced in the sitting position, with her hips well drawn back. This detail should not be overlooked by the nurse, otherwise the upright position without adjustment is the cause of extreme fatigue to the patient because of the strain thrown upon the muscles

in the ilio-sacral region. A pillow at her back offers no relief in this position.

While the patient must be protected from unnecessary exposure, it is also important that the procedure of examination by the doctor should not be restricted by clothing coming in contact with the stethoscope during auscultation, or interfering with the process of percussion.

The front of the chest

The upper end of the blanket covering the patient should be tucked snugly about the waist and hips, and a pillow should be pressed against the lower edge of her back.

As the shoulder blanket is pinned in front, each side is lifted in turn, or moved about at will out of the way by the nurse. The patient's face is always turned away from the side which the doctor is examining, or an interposing folded towel may be used, a little distance from the patient's face.

The back of the chest

The shoulder blanket is turned around with the opening at the back and the corners thrown over the shoulders out of the way.

The abdomen

The patient lies flat on her back, the shoulder blanket is removed, placed across the chest and folded back at the waist line. The gray blanket is turned back at the pubes and tucked about the hips on each side, allowing sufficient room for flexion of the knees, in the routine examination of the abdomen.

Extremities

The hands and arms are uncovered and tested for tremor, etc., and the lower extremities for the reflexes. A depression is made in the blanket, between the patient's thighs, and one leg is exposed at a time from above the knee to the foot.

Spinal

Although the spine may be examined with the patient in bed, when observation of posture is desired it is best done with the patient standing on the floor. The patient is dressed in nightgown, opened at the back, wrapper, blanket, stockings and slippers. The blanket is pinned low about the hips and the wrapper is put on with the opening at the back, so that an unobstructed and complete view of the spinal column is obtained. The nurse stands beside the patient, ready to give support.

Pelvic

Rectal

In a routine rectal examination an enema may be ordered.

The patient is placed in the lateral position with hips on the edge of the bed, upper knee flexed and shoulder directed forward, and is protected with a blanket and towel as for an enema. If the rectal speculum is used, it is placed in a basin of warm 2% boric solution. A pair of rubber gloves, a small jar of boric ointment, a dressing towel should be at the bedside in a tray, and a round enamel basin.

Vaginal

Unless for special reasons, a vaginal examination is rarely done on a patient admitted to the medical service. In the surgical service it is usually part of the routine examination.

If the patient is able to get out of bed she is dressed in nightgown, wrapper, stockings and slippers. The patient should void, as the bladder should be emptied before all pelvic examinations. An enema is given, in addition, in special cases, when ordered by the doctor.

A large sheet and dressing towel should be provided, also a tray containing a small glass of lubricant, gloves, powder, bivalve speculum, uterine forceps, uterine sound, pledgets of cotton attached to long wooden applicators, cotton balls, round enamel basin. Slippers are removed and the patient assisted onto the table, and placed in the dorsal position. The clothing under her is tucked smoothly out of the way so that she is not lying on it. The hips should be at the extreme edge of the foot of the table and the heels should be braced in openings of the adjustable supports. The draping is done with the large sheet, as in catheterization, with the sides of the sheet hanging free. The wrapper and gown are folded back from the pubes. In addition to the draping sheet, a dressing towel may be placed over the vulva. The nurse's duties may include handing instruments, holding basin to receive soiled dressings or instruments, and changing the patient's position at the doctor's directions.

It is sometimes necessary to examine a patient in bed. If only a digital examination is to be made, the patient is left in the middle of the bed in the dorsal recumbent

position, with the knees drawn up and separated. All the upper bedclothing is turned down below the knees except the top sheet, which is used for draping; this is done in the same manner as in giving a douche.

If a speculum is used, the patient is placed on her back across the bed with the hips at the extreme edge and the knees flexed, the feet being placed on wooden extensions thrust under the sides of the mattress, allowing 27 inches spread for the feet. Adjustable metal stirrups which may be clamped to the side of the bed are very useful. The patient is draped as if on the examining table.

Other positions, such as the Sims, knee-chest, or standing position, are rarely used for examination, but chiefly for treatment. In such cases an experienced nurse should be called in to help the doctor.

XXXVII

PREPARATION OF PATIENT FOR OPERATION

General preparation the night before

Bath, head shampoo, if possible.
A light supper, or diet as prescribed.
Catharsis as prescribed.
Local preparation.

Local Preparation

The local preparation is an important procedure. An extensive shave is necessary in all cases, having the skin well lathered, and the razor sharp. Hold the razor nearly parallel with the skin, not at right angles to it. Pull back the skin to avoid injuring it and shave obliquely to the shafts of hair.

Preparation of nurse's hands and arm

A hot soap and water scrub under running water, paying particular attention to the finger nails. Scrub again, and finish with a thorough rinsing from hands to elbows.

Final steps in preparation

The shaven area is scrubbed five minutes with hot soap solution and a sterile gauze sponge, giving special attention to the region of the umbilicus in abdominal cases. Complete the scrubbing, using 70% alcohol two minutes.

Finally, the prepared area is protected with a dry sterile towel or pad, held securely in place.

Areas for shaving in special operations

Head and Face. Shaved by the hospital barber according to directions. (See Part II, page 398.)

Neck. In male patients with thyroidal diseases, shaving is done daily except on the day of operation. In neck operations the patient is shaved from angle of lower jawbone (mandible) from one side to the other, reaching down on the neck on each side as far as the interclavicular notch on front.

Chest. Shave from the neck to the umbilicus and as far as midline in the back.

Breast. The same as chest, including the axillary space and the upper arm to elbow.

Abdomen. This area includes gall bladder, gastric and appendiceal operations, hysterectomy, ovariotomy, and salpingitis; for the last three, including the shaving of the vulva and perineum. (See Part II, page 398.)

Kidney. Shave from beneath breast to median line in front, to midline behind, and over hips.

Vaginal and Perineum. (See Part II, page 398.)

Rectal. (See Part II, page 398.)

Varicose Veins. Hip joint to ankle on all sides. After preparation in some cases, in order to facilitate the location of the vein in operation, the nurse is asked to outline the varicose veins with gentian-violet or methylene-blue. The patient stands while this is done, in order to dilate the veins.

Preparation the morning of operation

Soap suds enema, if ordered.

Ether breakfast.

In stomach cases nothing by mouth.

If the operation is to be done under local anæsthesia, the patient can have a light breakfast of toast or coffee. If done in the afternoon, a light breakfast may be taken and no luncheon.

On departure to the amphitheater

Have patient void.

Give hypo ordered.

Put on laparotomy stockings and white blanket.

Remove any false teeth, plates, glass eye, jewelry, etc.

Remove or tie on rings as the patient prefers.

In pediculosis, be sure patient has on towel cap.

Variation in emergency cases

Dry shave is always done preparatory to application of iodine preparation later in amphitheater.

No enema unless ordered.

No dressing needed.

Patient sent to amphitheater with preparation outlined in preceding paragraph.

Mouth cases

Mouth wash every 2 hours, as a rule an antiseptic alkaline solution.

Orthopedic surgery

Local preparation is done 24 or 48 hours before operation.

Shave the area of operation, as above, page 244.

Preparation of nurse's hands and arms

Soap and water scrub for three minutes and soak in corrosive sublimate 1–2000 solution two minutes.

Completion of local preparation

Scrub the shaven area with soap and hot water and sterile sponges five minutes, with ether one minute; with alcohol three minutes; with corrosive sublimate 1–2000 two minutes.

Apply sterile dressing.

In a 48-hour preparation this routine is repeated, and each time the patient is scrubbed the operation should be carried out as an absolutely sterile procedure.

Vaginal cases. (See Part II, page 398, for shaving.)

Shave, scrub with soap and water.

A vaginal douche of corrosive sublimate 1–8000 is given to the patient either on the ward or operating room, where the preparation is completed.

A clean pad and T binder is put on the patient before going to operation.

Rectal cases. (See Part II, page 398, for shaving.)

Scrub the anal region with soap and water, apply pad and T binder.

A rectal irrigation of 1 gallon of salt solution is given in the operating room and the preparation for operation completed.

XXXVIII

DISCHARGE OF PATIENTS

Patients are discharged:
To Out-Patient Department
To local physician
To other institutions
"Against advice"
By death

Dressing the patient

The house officer has notified the nurse, and probably the patient, of the date of discharge. The nurse takes the clothes slip to the General Locker, where each article is checked, and all are tied in a half sheet and carried back to the ward. If the clothes are in ward lockers, as on Ward G, the skin ward, simply bring everything up to the ward. Carry a woman's hat separately, that it may not become crushed. Be sure to have all extra articles, such as bags, umbrellas, etc.

If the patient were an ambulance admission or did not have suitable clothing, see that some one is notified in time so there will be no delay. The outside clothing must be sufficient for comfort under existing weather conditions.

When no clothing can be obtained, second-hand clothes may be given the patient from the hospital supply. This is arranged by the head nurse.

The patient is allowed to dress an hour before going

home, not sooner, as he might walk out unnoticed by the nurse.

If he has been up walking about for some time, the clothes are taken to the bathroom, all tags are removed, and everything placed conveniently, including a chair, for the patient may wish to rest during the process of dressing. Be ready to assist if necessary, or if a male patient, see that an orderly assists him.

When the patient is too weak or excited, take the clothes to the bedside instead of to the bathroom.

In case the patient occupies a room he dresses there instead of in the bathroom.

Preparation of card and chart

On the back of the name card is printed in black ink, the date of discharge, service, diagnosis, and where discharged. The last diagnosis is written in red ink by house officer on the medication sheet and must be copied exactly on the card by the nurse.

The discharge is printed on the chart in black ink, under proper date, to whom, also, being written in, as "Discharged to local M. D." in pulse space. This, with medication sheet, history and yellow slip, is left on the head nurse's desk.

When the patient has received his belongings (nurse must make sure of this) he signs his name in the space indicated on the Clothes Slip, or if the clothes have been kept, as for private patients, signs a statement to that effect. The Clothes Slip is left with the yellow admission slip.

Determine from the list what the patient has in the safe and notify the cashier, who checks up the articles.

Discharge of patient from the ward

Unless the nurse is sure the patient will be able to walk the distance, he should be taken down in a wheel chair. The nurse is the best judge of the distance and the condition of the patient. In cases of doubt, always use the chair.

Give any slips to the patient which belong to him and take with patient to the cashier, who receives the patient's card, makes out the bill and has the patient sign for the return of any valuables.

When possible, the head nurse has sent a list of discharges to the cashier before eleven o'clock, that the bills may be ready. A slip showing how much is due is given to the nurse with the name card. The bill is given to the patient. Take patient, with card and slip, to the superintendent, who decides regarding payment of the bill. If satisfied, the superintendent gives the card to the nurse, who then takes the patient to Information window. Leave the card there.

Before leaving him with his friends the nurse should make final observations as to the patient's condition for making the journey home, whether long or short distance.

Special rules governing discharges

Every patient must be accompanied by a friend or relative unless permission to go alone is given by the superintendent on duty. If unable to notify the friends by letter, a telephone or telegraph message is sent by the head nurse or senior nurse. No action may be taken or notification given to friends or front door until such discharge has been authorized by the senior house officer. The following is an example of a telephone message:

45 Blank St., Stoneham, Mass. Tel. 446 M. To Mrs. Mary Doe. The patient, Maude Doe, will be ready to be discharged between one and two o'clock Sunday, November 2, 19—, from the Massachusetts General Hospital, if some one calls for her. November 1, 19—, Ward 16.

Surgical cases must leave hospital swathes, straps, etc., unless they are purchased. If not purchased, replace them with compress cloth.

Ambulance cases

These cases need not be dressed completely, but with enough to keep them warm. The remainder of the clothes are tied up in bundles for the friends to carry. The friend or relative should sign for clothes and valuables, if the patient is too ill.

The house officer arranges with the superintendent or social service department about ambulance cases. The ward is notified when to have the patient ready and to be sure everything is ready at the appointed time.

In such cases the patient is taken directly to the ambulance. The nurse then goes through the same routine of discharging a patient, stating to each office that it is an ambulance case. Friends or relatives may go with the nurse to receive property in safe, pay bill, etc.

Daily discharges

If the patient is to be discharged before 8 A.M., permission must be obtained and the patient's card put through the day before. It should be taken to the superintendent and cashier, not to the front door.

If the patient is to leave after 5 P.M., the card must be put through during the day.

Do not write in the date of discharge until the patient actually goes.

On the day of discharge, or at any time when the card is put through, go first to the cashier, then to the superintendent and finally to Information window.

Discharges on Sundays and holidays

Discharges on Sundays and holidays must be between 12.30–1 o'clock, or 2–3 P.M. If for some special reason, as "Discharged against advice," permission may be obtained from the superintendent to discharge the patient before or after that time.

The card is always sent to the cashier and superintendent the day before, so that the cashier may make out the bill and leave the property in the superintendent's safe. Do not show the card at Information window until the patient leaves, the next day, as that means that the patient's name is taken off the list as discharged, which makes the count of patients wrong; it is confusing, also, if friends telephone about the patient.

DISCHARGED TO OUT-PATIENT DEPARTMENT

When the patient is discharged to Out-Patient Department, the doctor makes out a slip, the lower part of which is given to patient for admission. The upper part is left at Information window with name card.

Other slips, such as those regarding diet, prescriptions, etc., are made out at the same time and given to the patient with detached portion of Out-Patient Department slips.

Prescriptions may be filled at O. P. D. Apothecary before 2 P.M. before going, if patient is able to pay for them.

DISCHARGED TO LOCAL M. D.

The patient is sent home, further care being given by the local physician. These are usually cases who have never been admitted to Out-Patient Department.

DISCHARGED TO OTHER INSTITUTIONS

The supervisor is notified that a patient is going from this hospital to another. She examines the head, nails, and general appearance before the patient is discharged. The nurse in charge of the patient is responsible for her condition.

DISCHARGED BY DEATH

A disease may terminate in recovery, in retarded or incomplete recovery, or in death. Death may occur suddenly and unexpectedly, but is usually preceded by certain indications of failing vitality. Among the earliest signs may be difficulty in swallowing; a gradual weakening of the radial pulse, with increasing rate and irregularity; and deep and labored respirations with tracheal *râles,* due to the presence of mucus. The temperature may suddenly rise a few hours before death, then slowly drop as the pulse rate increases. The condition of the skin is the same as in shock, cold and moist, the face drawn and pinched, and somewhat dusky. The patient shows marked mental apathy, indifference to what is going on, and is aroused with difficulty. On the other hand the patient

may be mentally alert, and apprehensive to the end. Such cases are inclined to get out of bed and should not be left alone on any account.

When the patient's illness assumes a serious aspect it is usual in a hospital to place his name on the "danger list." Under these circumstances the relatives or friends are notified, and are permitted to visit the patient in limited numbers at any time during the day or night as long as they are quiet and self-controlled in behavior, and do not disturb the patient.

The nurse is cautioned against attaching her signature as a witness to any legal paper at this time. If she should be asked to do this, she should refer the matter to the head nurse.

The attitude of the nurse should be that of quiet, sympathetic thoughtfulness and kindness to the family and friends. If the patient does not have a special nurse, this case should be one of her chief responsibilities. She should make an effort to be at the bedside of the patient as much as possible, and do what she can in the way of small attentions outside of her routine duties in caring for him. She may moisten his lips and tongue, bathe his face or gently fan, if it does not appear to annoy him. The knowledge that some one is at the bedside may, in itself, afford some comfort if the patient's mind be not too clouded.

As the end approaches the doctor, who is already aware of the condition of the patient, is notified. The nurse remains at the bedside with her fingers over the radial artery and retains that position two or three minutes after the patient has stopped breathing, to assure herself

that death has taken place. She then gently closes the eyes, and at once reports the death to the one in authority on the ward, who notifies the doctor. The doctor, following auscultation, announces the death of the patient, and the hour is noted as being the official time of death.

If relatives or friends are absent they are immediately notified by the hospital authorities. As soon as the doctor leaves the bedside, the nurse removes any apparatus used in the care of the patient, and leaves the body in the dorsal position, with one or two pillows under the head, and straightens the extremities. If friends are present they may desire to be left alone with the deceased for a few minutes. The nurse in the meantime prepares the necessary materials for bathing and dressing the body. In the case of a man the orderly cares for the body, but before it is taken from the ward the nurse should be sure that the work has been done properly. If necessary, the friends are courteously asked to withdraw before any evidences of the final preparations are in sight. They are advised and directed to the hospital office, where final business affairs are transacted. The nurse then carries her materials to the bedside. An assistant may be assigned if necessary.

Equipment for care of the body after death

The usual bathing materials, omitting bath blankets, and using washed gauze instead of a wash cloth.

2 laundry bags
2 large sheets
1 gray blanket
2 special tags, if a precaution case
special gown for the nurse

Mortuary package containing

shroud
large compress square
large picked cotton pad
pair of white stockings
6-inch four-tailed bandage for jaw
2-inch roll of cotton bandage
metal comb
orange wood stick
toothpicks
small piece of absorbent cotton
2 cotton roller bandages
safety pins, large and small
2 paper identification tags

Additional equipment is as follows:

If a surgical case,

2 packages of surgical gauze and adhesive plaster
pair of scissors

If death is due to streptococcus or any other infection, or to communicable disease,

rubber gloves

If a death following burns,

sheet wadding or cotton rollers
compress cloth or cotton bandages
washed gauze
dressings according to location of burnt area, whether of the body or extremities

The attitude of those who care for the body

While engaged in caring for the body, out of respect for the dead perfect quiet should be the rule. If any conversation, it should be carried on in a low tone of voice, and should be concerned only with the duties being performed. What must be done should be carried out thoroughly, decently, and expeditiously, without seeming haste. An hour is usually sufficient for this procedure. If near the visiting hour, transportation of the body will not be permitted until it is over.

Procedure

If on an open ward, screen the bed thoroughly. Have everything needed at the bedside. Loosen upper bedclothing. Place cotton articles in one laundry bag, and blankets in the other. The sheet over the body is removed later. Remove jewelry, if any, and place in envelope marked "Valuables." If unable to remove wedding ring, bind on with a narrow bandage and note on Valuables list.

Care of the head

Wash the face, attending to nostrils, and cleanse the teeth; if false, replace and, if necessary, use absorbent cotton to hold upper plate in position. Comb hair, part and braid neatly.

Apply four-tailed bandage over two cotton rollers, which are held in place under each angle of the jaw by an assistant. These permit tight application of the bandage without marring the skin.

Care of the body

Remove the nightgown. Bathe the body with as little exposure and disturbance as possible. It is slightly turned by the assistant while the back is being bathed. If the undersheet has become soiled, it is at this time folded upon itself and pushed out of the way.

The nails are now attended to. Then follows the application of the hip binder, made from the large piece of compress cloth folded in a triangle, in the center of which is placed the picked cotton pad. Both are slipped under the hips together; the pad arranged between the thighs and buttocks. The ends of the triangle are secured with large safety pins in front, the apex of the triangle being carried up between the thighs. Put on stockings and secure to the hip binder at each side; if the stockings do not reach, attach a piece of cotton bandage to the stocking, neatly, to serve as an extension. Bind the limbs together over the stockings above the knees, and at the ankles, with the 2-inch bandage, being careful not to let it cut in at its edges.

Final care

Put on the shroud, which is a long plain gown, gathered at the neck and wrists with a running tape. Remove the upper sheet and place in the proper laundry bag. To the wrist attach one of the identification tags on which has been plainly written in ink the patient's full name, ward, service, month, date, year, official time of death to the minute, and the statement "friends present" or "no friends present" at the time of death. Bring the arms close to the side of the body, cross one hand over the other, and hold in position with a couple of turns of cotton bandage carefully applied.

The body is slowly turned, and the edges of the shroud are overlapped at the back. At the same time one of the sheets is slipped under the body and so arranged that there shall be a little more sheet at the head than at the feet to allow for folding over, after the body has been enveloped, so that in transfer from bed to stretcher there shall be no disturbance of the covering. The orderly is notified to bring the stretcher, upon which the second sheet is spread and the body placed upon it and again enveloped as in the first sheet. Over all is placed the gray blanket in order not to attract attention, when transferring the body to the mortuary. At this time the orderly is given the second identification tag, filled out in duplicate of the first, which is placed on a stub on the desk of the official who delivers the body to the undertaker. If a woman or child, the nurse accompanies the body as far as the mortuary.

Special procedures

Following the death of a surgical patient the dressings are removed from the wound, and replaced with two or three folded sponges placed over and along the axis of the wound. Its edges are drawn together by means of wide strips of adhesive plaster.

In case of death from burns, any remaining blisters are opened, drained, and dried. They are then covered with washed gauze, over which may be placed a layer of sheet wadding and a compress cloth binder. In burns of the extremities, also, gauze is used, with cotton rollers and cotton bandage. In burns of the face little can be done except to clean with oil or vaseline, then with alcohol.

The final official steps

The usual routine is that of daily discharge, see page 251.

The name card, on which has been written the official time of death and the diagnosis, is taken to the information office within ten minutes after death.

On the chart is written in the space of the date "Discharged dead to Allen Street House," the mortuary; this is taken later to the Treadwell medical library to be filed, with history and treatment sheet. "Allen Street House" is written on the Clothes Slip also.

The Clothes Slip is taken to the clothes room and given to the officer in charge, where the clothing is claimed by relatives or undertaker and signed for. As the hospital is responsible for all property belonging to the deceased, until claimed and properly signed for, nothing is to be taken from the room by relatives or friends. Valuables are placed in a manilla clasp envelope, with the contents listed on the outside, name and ward of the deceased, and a duplicate list is made in the book provided for this purpose. The envelope and book are taken to the cashier, who retains the envelope with the valuables, and signs under the duplicate list in the Valuables book, which is returned to the ward. The valuables are later delivered to some responsible member of the family who is looking after the property, and who signs for them.

Care of bedside or room

The bedstead, rubber sheet, and stand drawers are washed with soap and water. The mattress and pillows are tagged for airing and replaced by others. The bed

is made up with fresh mattresses, linen and blankets, the room aired, and set in order.

Following a communicable disease, besides the care above, the walls are washed by the house cleaner, the mattresses tagged and sterilized, and all utensils of metal, china, or glass used in the care of the patient are boiled. Rubber goods are washed with hot suds and aired. Blankets and linen are placed in clean precaution bags, and tagged with the name of disease.

PART II

XXXIX

HOT AIR BATHS

Hot air or sweat baths are used to increase the functional activities of the skin and kidneys in such conditions as are associated with acute or chronic nephritis, namely, edema, anuria, or complete suppression, and in the early symptoms of uremia. They may be prescribed, also, in rheumatism to assist the elimination of certain acid bodies and toxins in the blood, to soften the fibrous tissues and lessen the stiffness of affected joints, and to relieve pain.

There are many methods employed and various appliances used for this treatment, such as the electric light or bunsen burner in place of the alcohol lamp, and for those who can sit up, the electric light cabinet. As a rule the treatment is best given in bed to patients who may suffer a setback from exposure or change of atmosphere, such as nephritic and rheumatic patients.

Points to be remembered during the bath

Patient should be given an opportunity to empty bladder before starting. Oversight of this may be the cause of great discomfort because of the effect of the treatment on the kidneys. The amount of urine voided immediately after the bath, if any, should be observed. In dropsical conditions the patient is sometimes weighed before and after the treatment to learn the extent of elimination.

If not on limited fluids the patient is given cool water or orangeade to drink at intervals of ten or fifteen

minutes throughout the hot air treatment. In nephritis, if the patient is edematous and on restricted fluids, the amount taken during confinement in the hot air bath goes into the sum total of 24 hours. The amount of fluids allowed in such cases is 60 ounces in 24 hours.

Note temporal pulse every ten minutes.

Watch thermometer closely. In some cases temperature of bath may be permitted to go as high as 140° F. before discontinuing the treatment.

Bathe patient's face with cool water for comfort during bath.

Have a second lamp ready to replace first if necessary, so that an even temperature may be sustained.

Take all precautions to avoid fire, using a damp cloth around funnel, and keep an extra blanket on hand.

If for any reason the nurse should be called away, a written note regarding present temperature and expiration of time of bath should be pinned to the cradle, and the head nurse should be notified. In any case the patient should be under close observation.

Equipment

5 gray blankets
2 large rubber sheets
patient's towel
rubber pillow case
gauze sponge
gauze head binder
ice cap
hot water bag
dairy thermometer
enameled basin
bathing solution
long wooden cradle
asbestos covered funnel and oven attachment to hold lamp
2 metal alcohol lamps, or can of solid alcohol
matches
pitcher of cool water or orangeade and drinking tube

Procedure

Preparation of bed and patient

Loosen upper bedclothing and remove spread. Turn back bedclothing at foot of bed, even with mattress, and at waist line from the head.

Place gray blanket over patient. Turn down bedclothing as usual to foot of bed. Fold neatly and remove.

Slip rubber case over pillow. Place a towel under patient's head. Turn patient and move to opposite side of bed. Unbutton nightgown.

A second blanket is used as a protective covering against accidental burning of the patient, and is also arranged for comfort, so that no two opposing surfaces of the skin are in contact, in the following manner: one of the blankets is doubled in two crosswise, and while the patient is still on his side it is placed on the bed with the fold towards his back and as high on the pillow as his head. The upper half is gathered and pushed under his back and thighs, the remainder tucked against his back. The patient is now rolled over facing the nurse, and the blanket is pulled through on the opposite side.

The patient is turned on his back and nightgown is removed. His arms are raised above his head and the first side of the blanket at the top is placed across his chest as high as the axillary spaces and tucked in on the opposite side. The remainder of the blanket on the same side is tucked between the patient's thighs and knees and as far as it reaches. The patient lowers his arms to his sides and the second side of the blanket

is brought down in a straight fold over the shoulder, then turned sharply upon itself and carried over the opposite shoulder securely. Remainder of blanket is tucked under body.

A gauze head binder is wrung out in cold water and brought around from back of neck, and around head in turban fashion. Over it is placed the ice cap without a cover, the head binder taking its place.

A covered hot water bag at 125° F. is placed at the feet. The thermometer, which is attached to the rung of the bed above the pillow by a string, is placed in the region of the pelvis.

The cradle is placed in position and funnel and oven are attached to foot of bed, slightly at one side, to avoid the feet. A blanket is placed over cradle crosswise, over patient's shoulders, carried under lower pillows, and securely tucked under mattress.

Another blanket covers remaining portion of cradle, securely tucked in at foot of bed, snugly enveloping the funnel to prevent escape of hot air.

Administration and observation

Light the lamp and place in the oven. Note the time.

Two rubber sheets are added and arranged in the same manner as the blankets. Two more blankets are placed over rubber sheets. Finally, over all, the spread is put on and tucked under patient's chin to prevent contact with rough blanket. The end of spread is folded under itself even with foot of cradle to avoid coming in contact with hot oven and funnel. The temporal pulse is noted and the patient is given a drink.

At the end of twenty or twenty-five minutes note temperature of bath by carefully drawing the thermometer by the string to the edge of the blanket and reading the scale without exposing the bulb or permitting escape of hot air. Frequent observation of the patient's temporal pulse should be made throughout the bath.

If no special order has been given for the duration of the bath, and the temperature has reached 120° F., the bath may be continued fifteen minutes longer, unless it is contraindicated by the patient's condition, *i.e.,* weak and rapid pulse, restlessness, and a sense of oppression, flushed face and dry skin. If these signs are observed, the light should be extinguished at once and the patient's condition reported. The alcohol sponge and rub, part of the usual procedure, would then follow immediately.

Removal of blankets, cradle, and funnel

The light is put out and bedclothing is loosened to permit escape of hot air and slow evaporation of moisture from the patient's skin.

In about fifteen minutes all rubber sheets are removed and all blankets over the patient, save one, which is adjusted lengthwise to cover him fully, and tucked behind his shoulders to hold it in place. The funnel and cradle are then removed. The blanket in which the patient is enveloped is loosened on each side and serves as an under blanket during the sponge bath. The ice cap and head binder are left on until the end of the bath.

The sponge bath

While the patient is drying, preparations are made to give him a ten-minute sponge to restore the tone to the relaxed muscles, to cleanse the skin from the products of the sweat and sebaceous glands, and to refresh. A basin with one part of bathing solution to twenty parts water is used at 100° F.

The sponge is given in the same order as the alcohol bath in febrile conditions, except that towel friction is used altogether and exposure of the body is avoided in order not to chill the patient.

After the bath is finished the hot water bag may be refilled at the usual temperature and placed at the patient's feet. In some cases the blanket is allowed to remain over his body so that the activity of the sweat glands may be continued. The pulse is noted and the patient is allowed to rest.

XL

PACKS

A pack is the application of heat or cold to the body, in dry or moist form, through the medium of blankets or sheets.

HOT DRY PACK

When stimulation of the skin and kidneys is desired, the hot dry pack is sometimes used in place of the hot air bath, as a less extreme measure. It may also serve as a substitute when equipment for the hot air bath is not available in private practice.

Equipment

4 blankets
large rubber sheet
head binder
gauze sponge
patient's towel
4 hot water bags, or substitutes. See page 110
ice cap
basin with ice water
bathing solution
pitcher of cool water and drinking tube

Procedure

It is less disturbing to the patient to have the first arrangement of the blankets and rubber sheet prepared before bringing to the bedside. The pack is so arranged that the three blankets and rubber sheet are

introduced together under the patient, with the canvas side of the rubber sheet next to the bed.

Double the rubber sheet in two, rubber side out, and with open edges towards the nurse.

Double the three blankets crosswise in order to have each even with the others and the rubber sheet. Place the folded crease of the first blanket even with the folded crease of the rubber sheet underneath.

Throw back the upper half of the blanket. Arrange the other two blankets on top of the first in the same way, one over the other, so that a single layer, or half of each blanket, is lying upon the doubled rubber sheet. Grasp the edges of the blankets and the upper edge of the rubber sheet with both hands and fold over to the center crease and again upon itself. Next, grasp the folded thicknesses, raise and swing the remaining half of the rubber sheet to the opposite side. The remaining half of the three blankets and rubber sheet are drawn forward in three or four fan-like folds meeting the folded thicknesses. These are brought together and compactly folded end to end in thirds and carried to the patient's bedside.

The upper bedclothing is turned down to the foot of the bed with the fourth blanket. The rubber pillow case is drawn over the cotton one. The patient is rolled on his side and the fan-folded part of the blankets and rubber sheet are slipped under him together. All are placed high enough on the pillow to cover his shoulders later. The nightgown is removed and each blanket in turn, and finally the rubber sheet is wrapped around the patient in the same manner as

the enveloping blanket in the hot air bath, except that they are turned under the feet. If not long enough an extra one may be used to cover the feet.

A hot water bag, half full and free of air, temperature 140° F., is placed on each side of the patient, a third is placed under his knees, and a fourth at his feet, all outside of the blankets. Finally the large rubber sheet is wrapped about all to keep in the heat. The fourth blanket, which was used to turn down the bedclothing, may be folded across and laid over the rubber sheet. The upper bedclothing is drawn up and the sheet tucked under the patient's chin to prevent contact with blanket.

The head binder is wrung out of ice water and applied, and over that, the ice cap. The patient's temporal pulse is noted and a drink of cool water given every ten or fifteen minutes, if on forced fluids. The patient is usually left in the pack from thirty minutes to one hour.

Sponge bath

This treatment is followed with an alcohol sponge and rub, with the temperature between 85°–95°. While giving the sponge, avoid exposure of patient and consequent chilling by too sudden change of temperature.

HOT WET PACK

A hot wet pack, because of its moist, penetrating heat, is usually more effective than the hot air bath or hot dry pack when quick stimulation of the elimina-

tive organs is desired, in such cases as uremia and general edema, in acute nephritis, in renal irritations following corrosive poisoning, and occasionally in the toxemia of pregnancy to ward off convulsions.

Equipment

4 gray blankets
large rubber sheet
half sheet and rubber protector for bed
canton flannel half sheet and broomsticks to serve as wringers
rubber pillow case
gauze sponge
face towel
head binder
ice cap
hot water bag with cover
round enameled basin
foot tub
pint graduate
bathing solution
bath thermometer
pitcher of cool water and drinking tube

Sandwich of blankets and rubber sheet for envelopment of patient

Double first gray blanket crosswise. (Fig. I.)

Fold rubber sheet, cotton side out, with its fold matching that of the blanket. (Fig. II.)

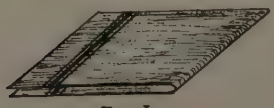


Fig. I

Fig. II

Open rubber sheet and place upon it the second blanket, folded in the same way. (Fig. III.)

Open top blanket and grasp upper edge of first

blanket and edges of rubber sheet and second blanket. Fold to center and then fold again. (Fig. IV.)

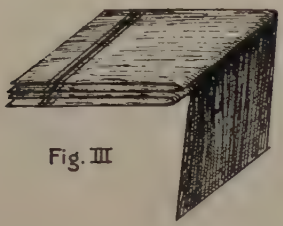


Fig. III

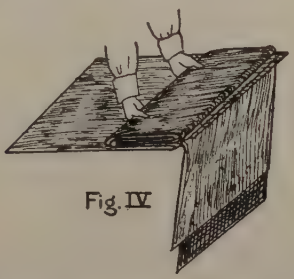


Fig. IV

Grasp folded thicknesses, raise and swing remaining half of lower blanket under to opposite side. (Fig. V.)

The unfolded remaining half of the two blankets with rubber sheet between is drawn up in three fan-like

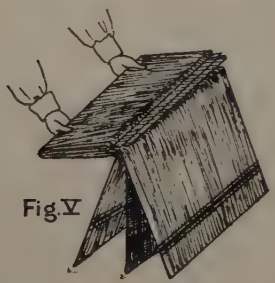


Fig. V

Fig. VI

folds (Fig. VI) meeting the folded side, and the two folded sides are brought together, as in Figure VII. They are folded end to end in thirds, as in Figure VIII, ready to be taken to the patient's bedside.

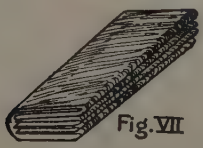


Fig. VII

Fig. VIII

Third blanket

The third blanket, which should be rather light weight, serves as the hot wet application and is folded across, then each side gathered in fan-like folds towards the center of the blanket. The folded sides are brought together, as in Figure VII, then folded end to end in thirds, as in Figure VIII, and placed within the canton flannel half sheet in the foot tub, ready for saturation with hot water later.

Preparation of the patient

The fourth gray blanket is used to turn down the upper bedclothing in the usual way. The half sheet with rubber protector is placed at the foot of the bed to protect the mattress below the margin of the draw sheet at the patient's feet. The rubber pillow case is slipped over the cotton case of the top pillow. The patient is turned on his side and the nightgown is unbuttoned. Putting the fan-like folds towards the patient's back, place sandwiched blankets and rubber sheet high enough to cover the pillow, then slip lower part under the patient's legs. He is then turned towards the nurse and the remainder of the blankets and rubber sheet pulled through and adjusted. The patient is rolled on his back and the nightgown removed.

The blanket comes next his skin and serves as a protection against burning. Cover by bringing the first side of this blanket across his chest as high as the axillary spaces. Push the blanket down between his legs as far as the ankles, so that there are no opposing

skin surfaces. The second side of the blanket is drawn snugly at the back of the patient's neck and brought down in a straight fold over the shoulder; it is then turned sharply upon itself and carried over the top of the opposite shoulder. The remainder of the blanket is tucked smoothly under the patient's body.

Wring the head binder out in the ice water and encircle the back of the neck and head. The patient is turned on his side and the blanket which was used to turn down the bedclothing is loosely thrown over him.

Preparation and application of hot wet pack

The blanket in the canton flannel half sheet is well saturated with water at 140° F. A nurse and an assistant stand opposite each other, with the tub between them. Each takes a stick and rolls an end of the half sheet over it, securing it firmly by folding the selvage edges over the stick. Both continue to roll and twist the sticks in opposite directions until the blanket is wrung as dry as possible, when the sticks are removed. The foot tub is emptied and used to carry the blanket, still enclosed in half sheet and covered by a small rubber sheet to hold in the steam, to the bedside.

The steaming blanket is removed from the half sheet, partly unfolded on the bed, and quickly applied by placing its center against the patient's back. The first half of the blanket is carried over the patient; the other half, which is still in folds, is passed under his legs. As he is being turned on his back the remainder is pulled through and quickly wrapped about him under cover of the blanket.

The rubber sheet, being next in order, is applied by bringing its first side in a straight line over one shoulder, which is turned sharply upon itself and carried over to the opposite shoulder. The second side is folded in the same way and its loose edges tucked alongside of the patient.

The ice cap is applied over the wet head binder.

The loose fourth blanket is removed and the last blanket of the sandwich is wrapped about the patient, like the rubber sheet.

A covered hot water bag at 125° F. is applied to the feet, which are kept outside of the pack.

The fourth blanket is folded across and replaced over the patient; the bedclothing drawn up and the upper sheet fitted under the chin to prevent contact with blankets.

Observations

The time is noted and temporal pulse taken. If not on limited fluids, cool water is given through a drinking tube at intervals of ten or fifteen minutes. Frequent observations of the pulse are made for feebleness, and of the general condition of the patient for signs of faintness or prostration. Sweating should take place in twenty minutes. The patient usually remains in the pack thirty minutes.

Removal from pack

Turn down the upper clothing. Loosen enveloping blankets and rubber sheet on each side under cover of

the fourth blanket, as sudden chilling of the patient should be avoided. Remove ice cap. Turn patient on his side. Fold the moist blanket within the rubber sheet and remove, together with the protective blanket, which has been next to the body. The patient is turned on his back and is now lying on the remaining blanket, which has been part of the pack. Replace ice cap and prepare the water for the sponge bath.

The sponge bath

The sponge bath is carried out as in the hot air bath or hot wet pack.

Completion of the pack

The ice cap, hot water bag, and under blanket are removed. The patient is turned on his back, the rubber pillow case taken off, the nightgown put on, and the upper bedclothing pulled up in the usual way. The blanket next the patient's body is added when needed to continue the effects of the pack.

The pulse and general condition of the patient are noted. The bedside is left in order and all equipment is neatly stacked together and carried out to the lavatory and attended to. The wet wringer and blanket are hung up to dry, with the blanket which protected the patient.

COLD PACK

A cold pack is given for its tonic and sedative effect upon the nervous system in cases of chorea, delirium, insomnia, or in conditions of nervous exhaustion.

Equipment

3 gray blankets
large rubber sheet
large cotton sheet
half sheet and small rubber sheet
head binder
gauze sponge
patient's towel
ice cap
hot water bag with flannel cover
basin with ice water
foot tub with water 75° F.
bath thermometer
bathing solution

Preparation of blanket and sheet

Blankets and rubber sheet are folded as described in hot wet pack. A half-worn cotton sheet is best, because of its soft texture. Its selvage edge on one side is folded back so as to give a width sufficient to cover the patient from neck to ankles, while its length will fully envelop him. Each hemmed end is rolled towards the middle of the sheet until they meet. The sheet is now wrung out in the tub of water either with a clothes wringer or by hand, when the process is carried out by grasping the sheet at one end with both hands and forcibly twisting in opposite directions until the other end has been reached. The sheet is carried to the bedside in a basin.

Putting the patient in the pack

The procedures in turning down the upper bedclothing, application of rubber pillow case, half sheet and rubber at foot of bed, the introduction of the sandwich of folded blankets and rubber sheet under the

patient, application of cold head binder, ice cap, and hot water bag, are carried out in the same order as that of the hot packs.

While the patient is lying on his side with his back to the nurse, the moist sheet is applied, with its center to his spine, when its upper side is quickly unrolled and slipped under the upper arm and over the body to the opposite side. The second half of the sheet is pressed against the lower edge of the patient's back and pushed under his legs. He is then turned and the remainder of the sheet drawn through on the opposite side. The first half of the sheet is brought over the patient's chest and tucked under the opposite arm and between the thighs and legs down to the ankles, so that all parts of the body come in contact with the sheet. The patient is now lying with each arm down by his side ready to be enveloped with the second side of the sheet, which is carried over one shoulder in a straight line, then sharply turned and tucked over the opposite shoulder and along his side. He is next enveloped in the blankets and rubber sheet upon which he is lying. The blanket, which serves as a covering, is removed and the bedclothing is drawn up. The patient may shiver for a moment from the shock of the first application of the moist cold, but when the air is shut out by the quick application of the first blanket, the sense of discomfort disappears as soon as reaction sets in. This should be followed by relaxation, languor, and sleep. If awake, the patient is given a drink, warm or cool, as he prefers. The temporal pulse is noted at frequent intervals, and the color and expression of the face.

The patient is usually left in the pack, if reacting satisfactorily, from forty minutes to one hour, then removed and given a ten-minute sponge with friction.

If not reacting inside of twenty minutes, unfavorable indications would be a sense of chilliness or faintness, weak pulse and pinched expression. Under these circumstances, remove from the pack and give brisk friction with a warm towel, avoiding exposure to air; roll up in a warm blanket; or apply hot water bag and give hot drink.

COLD PACK AND SHEET RUB

This treatment is prescribed in febrile conditions, as that of typhoid fever, for stimulation of the vaso-motor system, for its sedative effect in restlessness and delirium, and for reduction of a high temperature.

Equipment

small rubber stand cover
gray blanket
large cotton sheet
large rubber sheet
rubber pillow case
head binder on ice
patient's towel
ice cap
hot water bag
basin of water at 70° F.
foot tub of water at 80° F.
whisk broom
gauze sponge
short-sleeved cotton gown for the nurse

Preparation of the sheet

The cotton sheet is folded along one selvage edge and measured to cover the patient from neck to ankles.

It is then rolled from each end towards the center, as in the cold pack, is then wrung out of the water at 80° F. and carried to the bedside in a basin.

Packing the patient

If a typhoid patient, unusual care is exercised in moving him. Turn down the upper bedclothes with the gray blanket in the usual way. In communicable diseases the pillow next to the patient is protected with a rubber case under the cotton one. The cotton case is removed. The patient is turned on his side, nightgown unbuttoned, and rubber sheet placed lengthwise upon the bed with its upper edge high on the pillow above the patient's shoulders. The edge of the rubber sheet is slipped under the patient, who is then turned on his back, and the sheet adjusted on the opposite side. The nightgown is removed and head binder is applied. The patient is again turned on his side and the sheet applied as in the cold pack. A hot water bag at 125° F. is applied to feet under rubber sheet, and ice cap to head. Remove blanket, which leaves patient exposed to air in wet sheet. The face is bathed with gauze wrung out of cold water.

In five minutes the sheet is usually warm with the heat absorbed from the body, and is cooled again by dipping the broom in the basin of water at 70° F. and sprinkling the exposed surface of the sheet until quite wet. In order to stimulate reaction, the sprinkling is followed by light, brisk rubbing with the sheet from shoulders to feet, avoiding the abdomen. To get a purchase on the sheet in rubbing, it is necessary to lift

its clinging folds slightly from the patient's body. If the patient's condition favors reaction, *i.e.*, good quality of pulse and no cyanosis or rigor, the process of sprinkling and rubbing may be repeated. The patient is next turned, and his back and also the back of his thighs and legs are sprinkled and rubbed. The whole treatment lasts from twenty to thirty minutes, the time depending upon the physical toleration of the patient. Jerky motions should be avoided while rubbing the patient.

With the patient still on his side, the gray blanket is replaced, the ice cap and head binder removed. The hair is dried, if wet. The first half of the wet sheet is removed and its lower end slipped under the patient's legs along with the rubber sheet, which is folded instead of rolled upon itself to avoid wetting the canvas side. The patient is dried from the back of his neck to his heels, using light friction with the towel. He is then turned on his back upon the dry bed. The wet sheet is removed and lifted into the basin, also the folded rubber sheet. The drying of the patient is completed. Replace the cotton case and the nightgown. The hot water bag is refilled and put at the patient's feet, if needed. Draw up the bedclothing with the gray blanket.

Note the patient's general condition. Take drop temperature, pulse, and respiration one-half hour after removal from pack and record on four-hourly chart.

XLI

A SLUSH OR BED SHOWER BATH

A slush bath is the showering of water directly on the patient's skin by means of a large sponge, followed by brisk friction with the nurse's hands.

Purpose

This treatment is usually prescribed in typhoid fever when the temperature of the body is persistently high, accompanied by a steadily rising pulse; in the restlessness of delirium; and also in sunstroke.

Contraindication for baths

Baths are contraindicated in hemorrhage, in extreme abdominal distention, or if there is any serious change in the patient's pulse.

Reaction

For a good reaction much depends on (1) the way the bath is given, (2) the patient's general condition and height of temperature, (3) his normal robustness, and (4) his habituation to the use of cold baths in health.

In order that the shock of the bath may be lessened, a second nurse should be detailed to assist, so that while one nurse is showering the patient the other may be rubbing, thus insuring quicker reaction.

To avoid delay in the operation and unnecessary exposure of the patient between procedures, each nurse

should be provided with a sponge to bail out the water, and should assist the other in carefully turning the patient, preventing any effort on his part to help himself which might cause abdominal strain, or heart exhaustion. Open windows near the bed should be closed during the bath to avoid chilling the patient.

Equipment

special rubber table cover
3 heavy gray blankets
1 large rubber sheet
2 patient's towels
head binder wrung out of water and placed on ice
ice cap
hot water bag
grass sponge
2 pieces washed gauze
basin with block of ice
empty basin
foot tub of water, 80° F.
nurse's special rubber apron, and short-sleeved cotton gown
basin of hot, soapy water for nurse's hands

Method of making grass sponge

surgical gauze, ¾ yard
sheet wadding, one-half doubled sheet
absorbent cotton
Egyptian grass, a weed used in the manufacture of mattresses
red tambour cotton
needle and white thread

The folded gauze is spread on a table and upon the center are placed the sheet wadding, the absorbent cotton, and as much grass as two hands can hold together. The hard, loose stems are picked out and the grass is enveloped in the absorbent cotton, not too compactly, and the center and ends are overcast in

long stitches. This is covered by the sheet wadding applied in the same manner, then the surgical gauze, which is folded in and buttonhole stitched, if for typhoid patients, with red tambour cotton, along the center and at each end. If more than one typhoid patient is on baths, each sponge bears a patient's initials for identification. The grass center helps to make the sponge porous and permits ready absorption of water. The absorbent cotton and sheet wadding hold the water. The gauze adds to the durability of the sponge and holds it together.

Preparation of nurse, bed, and patient

At the bedside the nurse rolls her sleeves above her elbows, removes her uniform apron, puts on her rubber apron, and over that her long cotton gown. The upper bedclothing is turned down with the gray blanket, in the usual way. The cotton pillow case is removed, leaving the rubber case in place. The patient is carefully turned on his side, the nightgown unbuttoned, and the rubber sheet slipped under. The patient is then slowly turned on his back, the rubber sheet pulled through on opposite side, then turned over him on each side, temporarily.

An improvised tub is made by folding each blanket in fourths lengthwise, then rolling firmly and placing near the edge of the mattress on each side, reaching from the top of the pillow to the foot of the bed to give plenty of tub space. The edges of the rubber sheet are brought over the blanket rolls at each side of the bed, making the sides of the so-called tub. The

patient's arms are withdrawn from the sleeves of his nightgown, which is to be removed later. The blanket covering the patient is removed and folded across in the middle to fit the foot of the bed, then rolled tightly in fourths and placed across the extreme foot of the bed under the ends of the side blanket rolls to raise them up and give greater depth to the improvised tub. Binder and ice cap are applied to the head. A towel is folded part way, the double part covering the patient's abdomen and the single end tucked between the thighs, or a binder may be applied about the loins, pinned down the side. The hot water bag is placed under the rubber sheet at the feet.

A few sheets of newspaper are spread on the floor at the bedside, and a basin placed to catch any water that may drop. The temperature of the bath water, the time the bath is started, and the patient's pulse are noted. The bath thermometer remains in the tub.

Procedure

The nightgown is removed and the patient's face is bathed with cold water, using washed gauze. The grass sponge is then held under the water in the tub with both hands, lifted out and held about two feet above the patient, when the water is gradually squeezed from the sponge while it is carried back and forth over his body until it is showered. This operation is repeated until the patient lies in a pool of water. Friction and further application of water are kept up continuously, the nurse laving the patient with the water in which he is lying and rubbing briskly at the same time with

both hands from shoulders to feet to stimulate reaction, avoiding the abdomen. In phlebitis the affected extremity is not rubbed.

The basin on the floor is then placed on the side of the bed and the water about the patient is sopped

A SLUSH OR BED SHOWER BATH

In giving the bath the nurse stands at the right of the patient. To get the picture, however, the nurse stood on the opposite side.

up as quickly as possible with the sponge, which is squeezed into the basin, then turned back into the tub. Quietly place a small block of ice in the tub, leaving it until the temperature of the water is lowered to 75° F., at which it should be maintained until the completion of the bath. The ice is returned as often as the temperature goes above 75° F.

The patient is next turned slowly on his side and the ice cap placed at the back of his head. The back of his body is showered, including the thighs and legs. The procedure is repeated as already described.

The patient's pulse, color, and general condition are noted for quality every five minutes, between procedures. If all is well, the whole process is repeated.

Duration

The one procedure of showering the patient, applying friction, and removal of water from rubber sheet takes five minutes. This may be repeated four or five times, or twenty minutes for the whole process, the time being evenly divided between the anterior and posterior body.

Completion

While the patient is still on his side the ice cap and head binder are removed and put in the empty basin. The water is sopped up from the rubber sheet and the sheet folded upon itself at the patient's back, and slipped under the legs. The blanket roll at the foot of the bed is removed, the blanket doubled, and placed over the patient. The hot water bag is taken out. The abdominal towel is removed, and placed in basin. The back, upper arm, and legs are dried with a towel, using brisk, light rubbing. Care should be taken to dry thoroughly opposing surfaces of the skin, as arm spaces, groin, between toes, etc. Finally, the patient is turned on his back in the dry bed and the rubber sheet is removed without wetting the bed, by bringing the sides together first, then gathering it up

at each end, and folding it upon itself in the basin. The drying of the patient is completed. The cotton pillow case is replaced, nightgown put on, and bedclothing drawn over patient. If he is chilly, the special blanket is left on next to his body until he reacts, the hot water bag refilled, covered, and placed at his feet.

Treatment in failure of reaction

When there is failure of reaction, renew efforts in giving more vigorous rubbing, and lessen applications of water. If this fails, stop procedures, remove patient from bath, dry, wrap in warm blankets, apply hot water bags, give hot drink, watch pulse, and keep patient quiet. When reaction has set in and patient has recovered from shock, remove blanket and hot water bags.

Failure of reaction is indicated by:

cold skin and elevation of papillæ, or goose flesh
tense muscles
continuous shivering, in spite of rubbing
contracted arteries with small wiry pulse
cyanosis and pinched facial expression
shallow respiration
nervous irritability and dread of the operation

Benefit of the bath

The benefit of the bath may be determined by the condition of the patient afterward, as follows:

stimulating effect upon the vaso-motor system
improved quality of pulse, lessened rate, and increased arterial tension

stimulation of respiration, intake of more oxygen, absence of cyanosis, improved color
return from stupor to consciousness
quieting effect in delirium, evident when reaction follows first shock of the bath
influence in controlling the temperature
aid in elimination
prevention of bedsores and furunculosis

Method of charting the reaction

The temperature, pulse, and respiration are taken one-half hour after the bath, and are each recorded in red ink in running dots on the four-hourly chart in the same space and directly beneath the last notations of temperature, pulse, and respirations.

Disposal of equipment

A second foot tub, lined with a sheet, is kept at the bedside, in which are placed the three blankets used in the bath, also the ice cap and hot water bag when not in use, and the rubber table cover. The overhanging ends of the sheet serve to cover the supplies in the tub.

The basin of ice is emptied into the tub of water to make room for the grass sponge, towels, and washed gauze, which are tied up in the head binder. The newspapers are placed in the basin with the rubber sheet, which is stacked over the other basin.

The nurse's hands and arms are scrubbed with soap and hot water, two minutes for each hand and arm, including cleansing of the finger nails. The hands are

dried and the towel discarded. The gown is removed and hung on the screen hook, inside in, by the arm holes. The rubber apron is removed later. The remainder of the equipment is carried to the lavatory, avoiding contact with anything on the way.

The equipment is placed on the floor, until the shelf of the sink has been covered with newspaper. The bath thermometer is placed in its special jar of formalin solution 2%; the bath water is poured into the sterilizing hopper; the tub rinsed and emptied in the same place, then put into the utensil sterilizer.

If lavatories are limited in space, it may be necessary to use the bath tub for the large rubber sheet, if it is one that cannot be sterilized, or in the absence of a sterilizer. The sides and bottom of the bath tub are protected with newspapers. The remainder of the water is drained into the hopper from the rubber sheet, then it is spread over the top of the tub with its wet side uppermost, which is washed off with hot soft-soap suds, then dried with a hopper towel. The sheet is then suspended on its special bar to air. The towel used on the rubber sheet is added to the other things tied in the gauze head binder and sterilized for ten minutes. The newspapers are rolled up together in a clean newspaper, ready for the incinerator. Remove rubber apron and avoid touching tape neckpiece with the hands. The apron is washed with hot, soft soapsuds, dried with washed gauze, then snapped with the inside in and hung up beside the rubber sheet.

The nurse's hands are again scrubbed in a special basin in the lavatory and rinsed off, the water being

poured into the sterilizing hopper each time it is changed. The hands should be soaked for one or two minutes in bichloride of mercury 1–5000, then apply quince-seed hand wash.

As a personal precaution, one must not touch face or hair while handling materials that have come in contact with the patient directly or indirectly.

TREATMENT OF SUNSTROKE

Sunstroke is a cerebral disturbance of the heat centers and is caused by prolonged exposure to extreme heat, generally that of the sun on a humid day. The patient is usually in a state of unconsciousness, with an excessively high temperature (hyperexia). The temperature, which is taken by rectum, may range from 106° to 112° F. Such cases are frequently fatal, and are considered emergencies, calling for quick action in reducing the temperature by every means possible. It is easier to treat the patient in bed than in a bath tub. In case of collapse, two nurses or orderlies should give the bath.

If the slush bath is prescribed, the water is applied at a temperature of 65° or 70° F., with cold to the head and heat to the feet, and the routine of the bath is carried out as in the case of a typhoid patient, using plenty of friction following the showering.

The temperature and pulse are taken frequently and serve as a guide to the course of treatment.

The treatment is kept up until the patient's temperature begins to drop and his condition improves, *i.e.*, return to consciousness. Failure to respond to treatment would be followed by collapse.

XLII

SPECIAL BATHS

SITZ BATH

A sitz or hip bath is the immersion of the patient's pelvis and abdomen in hot or warm water in a low tub provided for the purpose.

This treatment may be prescribed for the relief of local pain and congestion in the pelvic or abdominal regions in such cases as delayed or painful menses, inflamed hemorrhoids, anal or urethral tenesmus, and in retention of urine.

For local treatment, the duration of the bath should be from ten to fifteen minutes, at a temperature of 110°–115° F. If given for sedative effect, the period should be thirty minutes to one hour at 94°–100° F.

A cool sitz bath is sometimes ordered for its tonic effect upon the intestinal tract in conditions of constipation. The temperature for this would be 68°–80° F. The period of immersion is ten or fifteen minutes.

Procedure

The patient is undressed and enveloped in a large, heavy bath blanket applied crosswise.

A gauze or compress cloth head binder is wrung out of ice-cold water and bound about the patient's head and neck.

The sitz bath is prepared with sufficient water to

cover the patient's hips. The temperature of the water should be tested before the patient is immersed.

The patient sits in the tub with his feet in a basin, or foot tub, of water at about 105° F., which helps to relieve the local congestion by increasing the blood supply in the extremities. The blanket is now arranged so that it envelops the tub and patient within its folds. If one blanket is not sufficient, two may be used.

After the treatment, the patient should be kept warm and allowed to rest.

In case a patient is too ill to sit up without support, this operation may be carried on at the bedside. The floor should be protected with newspaper or anything at hand that will serve the purpose. The tub may be placed close to the side of the bed, so that the patient may lean his back against it.

Additional support is afforded by placing a common chair on each side, back to the patient, who encircles the back of each chair with an arm. Under these conditions two blankets should be used. The first blanket is carried as high as the arm spaces, surrounding his knees and the tub, the other adjusted over his shoulders, giving freedom to his arms for self-support.

Substitutes for sitz tub

When the regular sitz tub is not available in giving this treatment, a small wash tub, or large pail, may be substituted. After pouring in the water, the edges of the tub may be padded with a large Turkish towel, or small blanket, arranged in folds and secured with a safety pin out of the way.

BRAN BATH

This bath may be given daily for soothing effect upon the skin. One pound of bran is used, in a thin cheesecloth bag, to a bath tub of water at 95° F.

STARCH BATH

This bath is usually given daily, sometimes more frequently. In the opinion of some authorities, it is better than the bran bath for soothing effect in all kinds of dermatitis and in other skin conditions causing itching.

Cornstarch is more desirable than potato starch, because of its finer quality.

Two level teacups of starch are used in enough cold water to dissolve it. Add boiling water slowly until a thick, smooth paste is formed. Add to tub of water at 95° F.

The patient remains in bath twenty minutes to one-half hour. On completion of the bath the patient's skin is simply patted with a towel, permitting as much starch as possible to dry on.

BICARBONATE OF SODA BATH

This bath is usually given twice a day in cases when continued use of starch is over-drying to the skin, and in such cases as the itching of urticaria and the pruritis of jaundice.

Two heaping teacups of soda are added to a tub of water at 95° F.

MUSTARD BATH

Mustard baths are occasionally used in cases of convulsions in children.

For this treatment one tablespoon of mustard is used to six quarts of water at 105° F.

An infant should be immersed about five minutes; a child over a year old, ten or fifteen minutes.

SEDATIVE AND CONTINUOUS BATHS

Sedative baths

Sedative baths are given for their soothing and hypnotic effect in conditions of insomnia associated with nervous restlessness and in states of physical and nervous irritability. To be of benefit, the temperature of the water should be as near that of the body as possible, or between 96°–100° F., and the duration from twenty to thirty minutes. The patient reclines in the tub with the water above his shoulders; he may sit on a rubber air ring or an old blanket may be smoothly folded and placed in the bottom of the tub, and a rubber sheet may be placed over the tub to hold in the heat. If the water should become cool before the end of the treatment, the tub may be partly emptied and replenished with water at a higher temperature, mixed well in the tub, so that an even temperature is maintained.

To help out the hypnotic effect of the bath, the patient, on getting out of the tub, should be enveloped in a sheet and briskly rubbed dry, then put into a warm bed with light covering. Some form of nourishment should be ready, either hot milk or cocoa.

In the care of a mental patient who may be restless and irritable and who cannot be persuaded to remain in the bath for any stated time, he is usually permitted to get in and out of the tub at will. In such a case, the temperature of the water must be closely watched and the room be kept comfortably warm.

Continuous baths

Continuous baths are used when prolonged immersion in the water is desired, the length of time varying according to the patient's reaction to the treatment.

Hospitals that employ continuous baths have one or two rooms fitted up with tubs and apparatus for giving them.

While in the tub the patient reclines under water, supported by a hammock-like contrivance made out of smooth, strong canvas, in which are openings about one inch square, to permit the water to pass through. The hammock is suspended by means of brass eyelets in the canvas and hooks attached to the rim of the tub. A rubber ring or waterproof pillow supports the patient's head above the water. A blanket and rubber sheet cover the tub to hold in the heat. The heat of the water is regulated by a thermostat, and for safety, in case of any defect in the thermostat, a bath thermometer is kept in the tub with the patient, to be consulted at frequent intervals. The temperature of the water, usually between 96°–100° F., is prescribed by the doctor.

In psychopathic hospitals these baths are considered of great therapeutic value and are used instead of restraint in controlling the irritability and motor excite-

ment of acute mania, alcoholic delirium, and other states of active mental disturbances.

The patient is left in the bath until the stage of excitement is over, which may be a few hours or, in some cases, days at a time. In the quiet periods the patient is sometimes removed from the tub and placed upon a cot nearby, briskly rubbed dry with a large Turkish towel, and allowed to rest undisturbed until he again begins to show signs of restlessness, when the bath is prepared and the patient replaced in it. When the treatment is continuous for days at a time, the patient is removed from the tub daily, and the skin thoroughly dried and lubricated to prevent maceration.

If necessary, the patient is given an enema at this time. Between immersions, the tub should be drained and washed.

Continuous baths are also an emergency measure in the treatment of severe and extensive burns on the body, for the protection of the burned areas against the air, thus allaying pain and preventing shock. The water itself, if not above body heat, has a soothing effect upon the exposed nerve endings. The contact of the water also serves to keep the wounds clean, lessening the danger of sepsis later.

If the burns are caused by strong acids or alkalies, a neutralizing agent is added to the water, which increases its sedative effect. In burns from acids, sodium bicarbonate is sometimes used; while in burns from alkalies, a mild solution of boric acid.

XLIII

THE CARE OF MOUTHS IN SPECIAL MEDICAL CASES

Purpose

To prevent reinfection and complications from bacteria and sordes.

To promote cleanliness and comfort and preservation of the teeth.

To improve the sense of taste.

To enable the patient to articulate more distinctly, thus requiring less effort to make himself understood.

IN COMMUNICABLE DISEASES

Equipment

special tray set with
- sputum cup or kidney basin
- covered medicine cup with warm antiseptic mouth wash
- Dobell's solution in atomizer
- albolene in nasal atomizer
- small jar of cold cream
- absorbent cotton swabs on applicators
- absorbent cotton swab on wooden throat stick
- squares of linen or muslin, 2 × 2 inches
- toilet paper
- small paper bag
- dressing towel

This tray is kept at the bedside.

Procedure

The patient's mouth is cleansed every three or four hours, according to its condition; as a rule, before feeding, otherwise it should be rinsed after food is taken. It may be added that if the fluid intake is sufficient, the possibility of a dry mouth is lessened.

In all special cases a gown is worn by the nurse, and in typhoid and venereal diseases, gloves also. The routine of cleansing the mouth, care of equipment, and care of the nurse's hands is the same in all these cases.

Pin the paper bag to the mattress. Line the bottom of the kidney basin with several layers of toilet paper. Fold back the upper bed clothing from the patient's neck. Double the dressing towel and place it under his chin cornerwise. Cleanse the upper and lower teeth, back and front, including the gums, with swabs dipped in antiseptic mouth wash. The same swab is not used twice; it is discarded into the kidney basin and a fresh one used. If he is able, the patient rinses his mouth with the solution.

Cleanse the tongue with the throat stick swab wet with the mouth wash; use its edges for gentle removal of coated surface, avoiding irritation of the tongue. When through, break the throat stick and place in kidney basin. Wrap all in the toilet paper and place in paper bag.

The Dobell's spray follows. First, test the atomizer, then direct its tip toward the patient's open mouth without touching it and quickly and thoroughly spray all parts. In cases when it is difficult for the patient to hold his mouth open, a gag may be necessary.

After the Dobell spray, the patient may desire to clear the mouth, in which case the sputum box or kidney basin is used.

If the tongue is dry and cracked, with a medicine dropper apply a few drops of olive oil or albolene, or place a pellet of cocoa butter on the tongue, which, as it melts, will serve as a good emollient. Spray the nostrils with albolene or use swabs dipped in olive or cottonseed oil, to soften the dried nasal secretions.

Finally, wrap a small muslin square about the tip of the index finger and daub and smear the lips thickly with cold cream. Discard muslin into paper bag.

After care of equipment

Remove gloves and place on tray. Wash hands if they have been in contact with outside of gloves. Remove gown in the usual way and hang, inside in, on the screen hook. Cover tray with dressing towel and carry to lavatory.

If paper sputum cup is used, empty into hopper and place in special paper bag to be burned. If kidney basin is used, empty and rinse into hopper and sterilize; also the medicine cup.

Should the atomizer tips come in direct contact with the patient when using, they should be sterilized; otherwise washing the tip and outside of each atomizer with soap and water will be sufficient. Wipe off cold cream jar with washed gauze. Place the small paper bag of discarded materials in the larger special paper bag. Place dressing towel in special laundry bag.

The rubber gloves are sterilized once a day; at other times, wash in hot suds and keep in basin of corrosive sublimate, 1–5000.

Wash the tray in hot suds, and dry. After the hands are cleansed, set up the tray again. Cover with clean towel and return to bedside ready for use again.

Care of nurse's hands

Scrub each hand two minutes, including cleansing of finger nails. Apply quinceseed lotion, as frequent washing is irritating to the skin.

IN PNEUMONIA

The mouth is cleansed every four hours. As an emollient for the tongue, albolene or white vaseline in a tube is used.

Deftness on the part of the nurse is desirable in this operation, as any interference with the patient's breathing causes distress.

XLIV

STOMACH IRRIGATION

Purpose

The stomach is irrigated or washed out to relieve persistent vomiting; in acute dilatation of the stomach; and as an emergency measure in getting rid of the stomach contents in poisoning or alcoholism.

Equipment

large rubber sheet or newspapers for floor
rubber apron
cotton sheet
half sheet and rubber, if a bed patient
round basin
foot tub or pail
large tray, set with the following articles:
- 2 half-gallon pitchers with water, temperature 100°–105° F.
- large stomach tube, usually one with the bulb and funnel attachment, buried in a basin of cracked ice
- kidney basin for salivation or vomiting
- gag, used in cases when the patient may bite down on tube
- dressing towel
- washed gauze wipes folded ready for use

When a stomach irrigation is anticipated in the morning before breakfast, the stomach tube is put in

a basin of finely cracked ice and placed in the refrigerator several hours before it is needed. Thus, the rubber tube is kept firm and cold and is more easily passed by the doctor, and more readily swallowed by the patient. In emergency, such preparation must be omitted.

Procedure

This operation is usually carried on in an ante-room; if at the patient's bedside, it should be thoroughly screened. Under ordinary conditions the doctor prefers to have the patient sit up in a chair. A comfortable armchair is placed in position; before it on the floor is spread the large rubber sheet. The foot tub is placed on the rubber sheet beside the chair. At the right side of the chair is a table, upon which is placed the tray with the pitchers of water covered by a towel. On the shelf beneath is placed the remainder of the equipment.

Preparation of patient

If the patient is able to sit up, he is dressed in gown, slippers, and stockings. False teeth on a plate are removed. The patient is seated in the armchair, and his clothing protected with a soft rubber apron, over that a cotton sheet folded and pinned at the back of the neck. For comfort a pillow is placed behind his back. The patient is given gauze to use in case of salivation in passing the tube.

Passing the stomach tube

Except in emergency, to insure coöperation on the part of the patient, especially if the experience be new,

he should receive instruction in regard to breathing and swallowing, also reassurance and encouragement during the operation.

There are different methods used in passing the tube. To facilitate introduction into the esophagus the patient is asked to sit erect with head slightly thrown back. The doctor stands at the patient's right, steadying his head with the left hand, while with the other hand the end of the tube is introduced, following the curve of the roof of the mouth, above the tongue over the glottis and into the esophagus behind.

As the tube is being pushed in, the patient is encouraged to keep swallowing until the marker on the tube has reached his teeth, which allows an extension of 18–20 inches from the lips through the esophagus to the stomach. If any trouble is experienced in passing the tube, the patient is made to lean forward as far as possible. This position renders the gullet almost horizontal, and also enables the patient to swallow more effectively. After the tube has reached the stomach the patient may sit upright again.

The irrigating solution, usually water, is poured slowly into the funnel by the nurse—about a pint, or two funnels full. The funnel is inverted over the tub and the stomach contents either siphoned out, if a straight tube, or withdrawn by suction, but the tube is never entirely emptied until the operation is over. The irrigation is done several times. If the water is not readily siphoned, the patient is instructed to tighten the abdominal muscles by "straining."

Bicarbonate of soda is sometimes added to the water.

In a case of poisoning or alcoholism, the irrigation is repeated until the water returns perfectly clear. In case of poisoning, a neutralizing agent is poured into the stomach through the tube; in alcoholism, usually a dose of magnesium sulphate solution.

Completion of operation

The tube is pinched and quickly withdrawn to avoid danger of its contents getting into the trachea. The patient's face is wiped with gauze, which is placed in the round basin. The patient should be given an opportunity to rinse his mouth.

The sheet and rubber apron are removed and the patient is helped to bed, or allowed to recline in a comfortable chair, if not a bed patient.

Care of equipment

The stomach tube is washed in cold water inside and out until free of mucus, then washed in soapy water, rinsed in clear tepid water, wrapped in gauze, and placed in boiling water. Sterilize for three minutes under supervision, as too long boiling will soften the rubber and injure it.

On removal from the sterilizer the gauze enveloping the tube is removed, the latter is drained and dried with a clean towel, and finally placed in a long, narrow, cotton bag which is tied about the neck of the protecting funnel and kept straight by hanging, as a kink in the tube would interfere with its future use.

All utensils are washed and dried.

Observations

The doctor usually makes his own observations as the stomach tube is emptied and at that time secures a specimen if he desires it.

Sometimes the presence of old blood is observed, in the form of "coffee grounds," or new blood, mucus, and undigested food.

Occasionally the chemical reaction is taken with litmus paper.

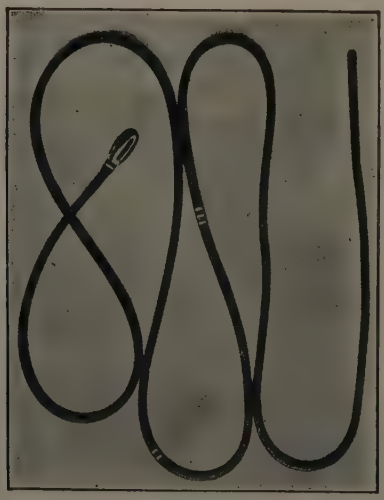
XLV

GASTRIC ANALYSIS

Gastric analysis consists in the withdrawal of the stomach contents by means of a tube before and after a test meal, for study of the stomach secretions and to aid in diagnosis.

The Rehfuss tube

This is a rubber tube especially devised by Dr. Martin E. Rehfuss, of Philadelphia, for aspiration of the stomach and duodenum. It is about three feet in length and one-eighth of an inch in diameter. Attached to



REHFUSS TUBE

one end is a small, smooth metal tip about the size and shape of an olive pit, perforated by openings to permit the drainage of the gastric contents into the tube while in the stomach. The other end of the tube permits the introduction of the tip of a 30 cc. syringe. For guidance the distances are marked on the tube to indicate when it reaches the cardia or upper orifice of the stomach, the pylorus, and the duodenum.

The tube is chilled by placing it in a basin between layers of cracked ice several hours before it is needed. If it is to be used in the early morning, the night nurse attends to this duty.

Equipment

rubber apron and sheet
washed gauze wipes
dressing towel
kidney basin
30 cc. syringe
Rehfuss tube coiled in basin of ice
2 wide-mouthed specimen bottles marked with the patient's name, ward, service, and date. No. 1 labeled, "Fasting contents"; No. 2, "Test meal."

Preparation of the patient

All fluids and food are withheld from the patient from 12 midnight until after removal of the fasting contents of the stomach, usually about 7 A.M. The procedure may be carried out in bed if the patient is too sick to sit in a chair. Otherwise, if able, he is

dressed in a gown, slippers, and stockings and seated upright in a comfortable armchair. The clothing is protected with the rubber apron, and over that the sheet is draped and the dressing towel tucked in about his neck. False teeth on a plate should be removed.

Procedure

As it is important to gain the coöperation of the patient in this procedure, careful instruction is given by the doctor as to what is to be done, and the reason for the operation. The patient is instructed how to breathe, and is assured that as soon as the tube passes the throat, the worst is over.

The Rehfuss tube is removed from the basin of ice by the doctor, who stands at the patient's right and slightly behind him, when the patient is instructed to throw back his head and open his mouth widely. The tip of the tube is placed on the back of the patient's tongue. He says, "Ah," and the tube is quickly thrust into the posterior pharynx. The first convulsive swallow carries it past the thyroid cartilage. With his fingers near the patient's lips, the doctor continually feeds the tube into the mouth with enough slack for the patient to swallow on. The patient is then instructed to breathe deeply through the mouth, swallowing occasionally. The tube usually passes down readily. Some retching may occur as the tube passes through the cardiac end of the stomach. With a few extra swallows the tube is in the stomach.

The 30 cc. syringe is introduced into the exposed end of the tube, and the fasting contents of the stomach

are withdrawn and put into the specimen bottle, which is labeled "Fasting contents." The total fasting contents are desired. When they are obtained, the syringe

REHFUSS TUBE IN POSITION FOLLOWING WITHDRAWAL OF FASTING CONTENTS

is disconnected and the tube is left in position, the exposed end being secured to the side of the patient's mouth or cheek, out of the way, with a strip of adhesive tape. The test meal is now given.

If the patient salivates freely, he is instructed not to swallow, but to use the gauze wipes or kidney basin, as swallowing the saliva, which is alkaline, may interfere with the chemical reaction of the analysis.

The test meal

The Ewald test meal is used to study gastric secretion and motility after the injection of food. This meal consists of a slice of bread with the crust removed,

WITHDRAWAL OF TEST MEAL

and a full glass of water. The patient is told not to drink the water all at once, but to eat and drink so that the bread will be thoroughly softened before swallowing. As a rule it is best for the nurse to feed the patient slowly.

Forty-five minutes later the test meal is withdrawn into specimen bottle No. 2, labeled "Test Meal," and

complete evacuation of the stomach is done by shifting the level of the tip several times before removing the tube.

Following the collection of the test meal the tube is withdrawn. The patient's mouth is wiped and rinsed. The sheet and apron are removed and the patient is allowed to rest.

Examination

Both fasting contents of the stomach and test meal results are examined. In addition to the pathological findings, the total amount, gross appearance, color, odor, and amount of sediment are recorded.

The pathological findings consist of an excess of pus, the presence of red cells, food residue, such as starch, etc., abnormal acidity, and the presence or absence of lactic acid.

After care of tube

The Rehfuss tube is washed inside and out with cold water. The opening of the tube being so small, it will be necessary to inject the water forcibly through the tube with a syringe. Wash in hot suds, rinse in tepid water, wrap in gauze, and place in boiling water to sterilize for three minutes. Remove, drain and dry thoroughly.

XLVI

DUODENAL DRAINAGE

Purpose

To secure bile from the duodenum and biliary passages for microscopic and chemical analysis; and for daily drainage in cases of catarrhal jaundice until infection subsides.

Equipment

tray, containing
- glass basin with Rehfuss tube in ice
- 30 cc. syringe
- 2 specimen flasks for collecting bile
- glass with one ounce of saturated solution magnesium sulphate
- kidney basin
- washed gauze wipes
- dressing towel

Procedure

With the patient sitting up in bed, the Rehfuss tube is introduced into the stomach about 18–20 inches. This is usually accomplished in three minutes and is aided by small sips of ice water. The patient now lies on his right side to enable more ready access of the tube through the pyloric valve into the duodenum, and swallows about seven inches or more of the tube during a period of about twenty minutes, until it reaches the

duodenum. This is a tedious process and may take from thirty minutes to one hour, sometimes longer, much depending on the type and mental attitude of the patient, and the manner in which the operation has been carried out.

The position of the tube is checked by fluoroscope. Magnesium sulphate solution is then injected through the Rehfuss tube with the syringe, and dilates the sphincter of the common bile duct and stimulates the flow of bile in about three to five minutes. The duodenal contents are collected by siphonage. First there is a slight flow of light colored bile, then a larger flow of dark colored bile.

The specimen is examined for pus, bile pigments, and the presence of abnormal cellular or crystalline elements.

XLVII

METHODS OF ARTIFICIAL FEEDING

GAVAGE

Gavage is the introduction of liquid food directly into the stomach by means of a rubber tube passed through the mouth or nose into the pharynx.

Purpose

This method of feeding is used because the patient for some reason cannot take food in the normal way, or objects to it. The latter condition is met in special mental types and delirious patients who cannot be persuaded to eat, having delusions about food itself or the partaking of it; and in children who refuse feedings.

Nature of diet

Liquid food of high caloric value is selected, as far as possible, at the same time offering the variety of a well-balanced diet, such as egg nog, milk, malted milk, cream, broths, strained vegetable soup, purées—especially tomato, beef juice, gruels, or strained cereals thinned with milk.

An example follows of a recipe for one feeding given twice a day to an adult mental patient to supplement insufficient intake of food in the ordinary way:

Egg Nog

2 raw eggs	1 teaspoon malted milk
2 glasses of milk	2 teaspoons sugar or lactose

Salt, strain, and warm to 102° F.

ORAL GAVAGE

Equipment for adult feeding

half sheet and rubber dressing towel	pint pitcher with feeding standing in warm water
washed gauze	cup of sterile water
stomach tube on ice covered graduate or	wooden gag

If the patient sits up, a comfortable armchair should be used, the patient being dressed in a warm wrapper or blankets.

Procedure

The procedure is the same as that of introducing the stomach tube in irrigation of the stomach, watching the patient's color and respiration, in case the tube should accidentally get into the trachea. As a test, a little sterile water is slowly poured into the tube, and if the patient's color is good and he is breathing comfortably, before the water has quite run out, the funnel is filled with the feeding, which is allowed to run slowly into the stomach. The operation is completed by following the feeding with more water, which cleanses the tube before removal. The tube is pinched, and removed quickly as its tip passes over the trachea.

In cases where there is danger of regurgitation or vomiting, the patient is put to bed, and kept quiet.

Equipment for feeding child

tray with
- kidney basin
- small glass of albolene
- catheter in cracked ice with funnel attached or a 30 c.c. syringe if the caliber of the catheter is quite small
- graduate with feeding at 90°–100° F. in a pitcher of hot water
- small pitcher of sterile water
- throat stick or handle of spoon covered with gauze to serve as a gag if needed
- small blanket
- dressing towel or bib
- rubber apron for the nurse

Procedure

It is essential that struggling be absolutely prevented or gavage is nearly impossible.

If the patient is a child of three years, or older, keep flat in bed and wrap in a blanket securely from shoulders to feet. Apply dressing towel as a bib. Use gag to prevent biting the tube.

If the patient is an infant, place the arms at the sides, wrap in a blanket, and put on bib. One nurse sits on a low chair, supporting the infant's body against herself and holding the head with both hands, across the forehead, with the head tipped back slightly.

The second nurse lubricates the catheter in the glass of albolene and introduces it as in the case of the stomach tube, observing that the catheter does not coil

in the back of the mouth and that it is 6 or 8 inches below the pharynx.

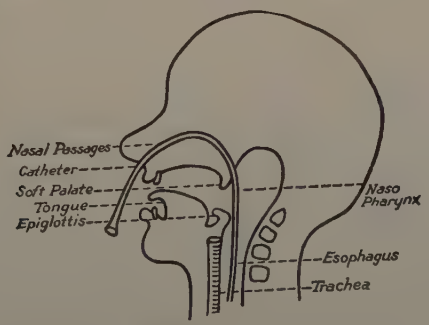
A little sterile water is first allowed to run through the catheter, and if the child is breathing normally, the feeding is slowly introduced. A hemostat may be used to snap the catheter, to keep out the air during the process of refilling the syringe. Throughout the procedure it is important that the patient be kept as quiet as possible, otherwise the feeding may be forced back into the catheter.

The catheter should be removed deftly, as in the case of adult feeding.

The catheter is cleansed by forcibly injecting cold water, then a warm 2% boric solution through it, with a syringe; finally placing in boiling water and allowing it to sterilize three minutes. Remove, dry with sterile gauze, and place in sterile towel, ready for use again.

NASAL GAVAGE

In nasal gavage the catheter is directed through the nasal passages into the naso-pharynx, and into the esophagus.



POSITION OF CATHETER IN NASAL GAVAGE

The size of the catheter varies according to age or to difference in size of the nasal cavities, because of possible deformities of the septum or large turbinate bones which may obstruct.

When gavage is continued for some time, the catheter is passed through one nostril, and then the other, alternating, because this operation is likely to be irritating to the sensitive mucous membrane at the back of the nose. In some cases, to avoid this, the catheter has been allowed to remain permanently in the nose. The end is then looped over the ear to keep it out of the way. Under these circumstances children should wear restraining cuffs to prevent them from pulling out the catheter.

Indications for feeding in this way are the same as those for oral gavage. Nasal gavage is considered more satisfactory by some doctors because of the greater ease of introduction and manipulation, because it is less disturbing to the patient, because there is less danger of vomiting, and this treatment is safer in the hands of a nurse.

This method of feeding is most commonly used for children and infants. Extreme gentleness and deftness are important. In the hands of an unskillful operator any bungling in passing the catheter is sure to cause unnecessary pain, frighten and excite the patient, provoke struggling and resistance, which should be absolutely prevented or gavage is nearly impossible.

Feeding

The amount and frequency of feeding vary according to the age of the child and the condition of health. A

child eighteen months of age may be given a feeding of 8 ounces every four hours, or about 1,000 calories a day. To a child eight years old the following order has been given every four hours:

egg, one — milk sufficient to make
lactose, 1 or 2 drams — 8 ounces

Any liquid food in concentrated form may be given, and in order to raise caloric value, lactose, cod liver oil, or cream is sometimes added to the feeding without causing regurgitation.

Foods are avoided which are irritating to the mucous lining of the nose.

Equipment

For a child

pitcher of hot water in which stands bottle with feeding at 90°–100° F.
small pitcher of warm sterile water
rubber catheter, connecting tube and funnel in the utensil in which they were sterilized
small glass of albolene or olive oil
absorbent cotton swabs
small blanket
dressing towel or bib

For an adult, the equipment is the same as in oral gavage, except that a rubber catheter, connecting tube, and small funnel are used in place of the stomach tube.

Procedure

As in oral gavage, if a small child or infant, his arms are placed down at the sides and the body from shoul-

der to feet is wrapped in a small blanket applied cornerwise. The patient is then propped up in his cot against pillows, and bib and dressing towel are placed under his chin.

The nostril is gently swabbed with albolene and the catheter also well lubricated. The nurse standing at the patient's right, with one hand grasps the back of his head and inclines it forward, as with the other hand she passes the catheter into the nostril slightly upward towards the partition separating the nostrils or septum and directly backward into the esophagus, about ten inches, watching closely for any signs of its entrance into the larynx. Were the catheter in the larynx or trachea when the feeding was poured in, quick death from asphyxiation would follow, or septic pneumonia would probably result from the inhalation into the bronchi of any part of the feeding. In order to know that the catheter is in the right position, a teaspoonful or less of sterile water is allowed to trickle into the funnel. If the patient starts coughing violently, is cyanosed, and the sound of air can be heard rattling in the catheter, it should be at once withdrawn and a fresh start made. If the patient's color is good, and he is breathing easily, one need not be apprehensive. When one has made sure by looking, or by the sense of touch, that the catheter has not doubled on itself in the patient's mouth, the feeding may be started, pouring a little at a time into the funnel at first, allowing it to run slowly into the stomach. Before withdrawing the tubing, another dash of sterile water is poured into the catheter and the catheter pinched and quickly withdrawn.

In order to insure retention of the feeding, the patient should be kept as quiet as possible. If an infant, he remains propped up in bed as long as comfortable. Nasal gavage is sometimes done by placing the infant on its side across the nurse's knees, where it is fed through the uppermost nostril.

The routine in after care of the materials is the same as that of oral gavage.

XLVIII

METHODS OF ARTIFICIAL FEEDING
Continued

RECTAL FEEDING

This method of feeding is employed as an extreme measure when the patient is taking no food or insufficient nourishment by mouth:

To tide over a temporary physical crisis.

To give the stomach rest following gastric hemorrhages.

In persistent vomiting and acidosis of diabetes mellitus.

In states of unconsciousness or coma, as in lethargic encephalitis.

In cases of obstruction between the mouth and gastro-intestinal tract.

In mental diseases attended by dread of taking food (sitophobia).

Food ingredients

It is the function of the large intestine to absorb and to get rid of waste left over from digestion, not to carry on active digestion. The ingredients used in compounding a nutritive enema are necessarily of concentrated food value so as to afford small bulk of a non-irritating nature and as easy of absorption as possible; accordingly it is necessary to predigest some of the food used in enemata.

The ingredients usually prescribed in the formulæ of nutritive enemata are peptonized milk, skimmed milk, beef juice, egg albumin, and saline solution. Occasionally, when greater density is desired, barley water or thin flour gruel is used. As the caloric content of a nutritive enema is low, glucose syrup is added to raise the food value, or it may be combined with the saline solution, alone. Saline solution, which is always used, provides the necessary salt, acts as a diluent, and aids absorption.

Formulae

In all cases the ingredients are to be mixed thoroughly.

I.

peptonized milk, 2 ounces
saline solution, 0.6%, 2 ounces
beef juice, 1 ounce
white of one egg
brandy, ½ ounce
tincture of opium, 10 minims, prescribed if enema is not well retained

II.

glucose syrup, 5%, 3 ounces
saline solution, 0.6%, 4 ounces
strained white of 2 eggs

III. (By Ewald)

wheat flour, 2 tablespoons
mix with warm milk or water, 5 ounces
1 egg and a pinch of salt added slowly while stirring
the whole mixed with 1½ ounces glucose, 15%

IV.

glucose syrup, 5%, 1 ounce
normal saline solution, 6 ounces
alcohol, 50%, 1 ounce

If not retained, the tincture of opium is sometimes prescribed for each second or every other enema for the first two days.

This enema is sometimes prescribed in inoperable carcinoma of the stomach.

Peptonizing milk

tea cup or graduate	thermometer
quart glass jar	milk
saucepan	peptonizing tubes

Each tube contains five grains of pancreatin and fifteen grains of bicarbonate of soda. The contents of one tube will peptonize one pint of milk.

By the action of the pancreatin in the presence of moderate heat and in an alkaline medium (the soda), the process of artificial digestion takes place, and will continue as long as the heating of the milk is kept up.

Empty one tube into a clean glass jar. Add four ounces of cold water and shake. Add a pint of milk and shake again thoroughly. Place the jar in the saucepan of hot water and keep at 115° F. for one hour, when it will be ready for use. Place on ice at once when through. A fresh supply should be made every 24 hours.

Equipment for compounding a nutritive enema

clean surgical gauze, ¼ yard, for straining egg albumin
pint graduate
ounce graduate
dessert spoon
enameled basin
pitcher of hot water
dairy thermometer
ingredients for the prescribed formula

Method of compounding Formula I.

Into the clean graduate measure the warm peptonized milk. Use warm water in converting the stock saline solution to 0.6%. The beef juice follows.

To avoid getting air into the white of egg, it is strained through gauze which has been moistened in cold water and placed on the top of the graduate. A spoon is used to stir the egg albumin through the meshes of the gauze.

The contents of the graduate are stirred and it is placed in the pitcher of hot water until the temperature is raised to 105° F. The graduate is then removed and placed in the basin, when the brandy and tincture of opium are added, the whole mixed, the utensils covered and taken to the bedside with the solutions for the rectal irrigation, if it is due.

The remainder of the equipment, blanket, etc., is the same as that for any other enema.

Procedure

Routine care of the colon

If the nutritive enema is made up largely of proteins, some unabsorbed residue may be left over, which de-

composes and ferments, causing irritation of the mucosa of the bowel. This may start a colitis and resultant inability on the part of the patient to retain the enema. To prevent this, a routine cleansing of the colon is carried on before each feeding, as follows:

One hour before the first nutritive enema one pint of ivory or castile suds is given (avoid the use of harsh soaps). When the feedings consist only of glucose syrup and saline solution, the suds enema will suffice, as the saline solution and glucose are quickly utilized by the tissues, leaving no residue.

Immediately preceding the subsequent feedings with other formulæ a rectal irrigation is done, using either a pint of normal saline solution, 2% boric solution, or a weak solution of bicarbonate of soda, *i.e.*, a level teaspoon to a pint of water at 105° F. The rectal tube is lubricated and inserted in the usual way, and half of the solution is slowly poured into the funnel, then siphoned out, except a little which is left in the tubing to prevent entrance of air.

Giving the nutritive enema

The preceding operation is repeated with the remaining solution, and without removing the rectal tube the nutritive enema is given by allowing it to trickle slowly down the sides of the funnel, which will allow the escape of air, or by filling the funnel with the nutrient and pinching the tubing to retard its progress. To insure retention, it should take ten minutes by the clock to give the feeding. The patient should retain it three hours because of the slow absorption of proteins in the colon.

Aids to retention

An empty bladder before the feeding is begun.

Avoidance of too large a rectal tube.

Pressure against the anal region with a pad or towel.

Elevation of the pelvis on a pillow or on a padded douche pan, with the patient's head lowered.

Elevation of the foot of the bed.

If suffering from tenesmus, warm applications of hamamelis may give relief. Cleanliness of the anal region is an important factor in avoiding tenesmus, since it may be due to irritation from decomposing food or from the salt solution. The part should be gently sponged off after each feeding without disturbing the patient, as quiet is necessary to retention.

Instead of the tincture of opium, an opium suppository may be prescribed.

Method of giving a rectal suppository

Lubricate the suppository. Wrap loosely in toilet paper, place within the folds of a hopper towel, and carry to bedside.

Place the patient in the lateral position.

The nurse draws a finger cot over her index finger; a finger of a discarded rubber glove will serve.

The suppository is held between the thumb and index finger and is inserted and pushed beyond the internal sphincter muscle with the tip of the finger.

Pressure is made against the anus with the towel for a moment to insure retention.

After care of utensils

The rectal tube, tubing, and funnel are washed in cold water, then in hot soapsuds, rinsed off and placed in a covered basin of warm water, and sterilized for five minutes.

This equipment should not be used for any other purpose than nutritive enemata. The other materials are cared for in the usual way, as instructed in the operation of a purgative enema, page 152.

Suggestions

The patient's mouth should be swabbed frequently and rinsed with water when he is not taking nourishment by mouth.

It is important that the nurse's hands and utensils should be thoroughly clean in preparing the feeding.

XLIX

CISTERN AND LUMBAR PUNCTURE

CISTERN PUNCTURE

Purpose

A cistern puncture is the injection of a needle into the *cisterna magna,* the large reservoir of the cerebro-spinal space at the base of the brain, for the following purposes:

In conjunction with lumbar puncture to diagnosticate spinal sub-arachnoid block.

Combined with lumbar puncture, for irrigation of the sub-arachnoid space.

As a route for serum injection.

Equipment

manometer, an instrument with a scale for determining the pressure of fluids
lumbar puncture needles with stylets fitted
10 c.c. graduate, or test tubes marked 1 and 2
novocaine, 1%, and sterile 2 c.c. syringe
iodine
collodion (flexible)
3 or 4 sterile towels
2 packages sterile sponges

Preparation of patient

An area 3 inches wide on the back of the neck up to the external occipital protuberance is shaved and

painted with tincture of iodine. Sterile towels are draped about the site of operation.

The patient is placed on his side, the head resting on a small pillow, with neck moderately flexed. Care is taken to maintain alignment to vertebral column and to prevent scoliosis or torsion. In cases where comparative readings are important the cistern and lumbar needles are on the same horizontal plane, with manometers attached.

Procedure

By the doctor

The skin at the site of operation is infiltrated with the novocaine.

The thumb is placed on the spine of the axis and the needle inserted in the midline, just above the thumb. It pierces the dura into the *cisterna magna,* from which cerebro-spinal fluid is obtained. The needle is usually inserted 4–5 c.m., 3 c.m. and 6 c.m. being the extremes.

METHOD OF COMPRESSING JUGULAR VEINS

By the nurse

The nurse has the test tubes ready for the reception of fluid. To raise the spinal fluid the nurse may be asked to make pressure on the carotid arteries. The pro-

cedure is simple, the thumbs are placed on each side of the larynx and gently forced backward toward the spine until the beating of the carotid artery on each side is felt. The patient experiences a sensation of fullness in the head, due to increased intracranial pressure, which is visible by a rise in the spinal fluid manometer. Care must be taken not to interfere with respiration, both for the comfort of the patient and the reliability of this test.

LUMBAR PUNCTURE

Lumbar puncture consists in tapping the spinal canal in the lumbar region with a hollow needle.

Purpose

To obtain spinal fluid for immediate diagnosis or for study.

To relieve excessive intracranial pressure.

For the administration of sera and drugs.

Equipment

tray on which are
- 3 sterile towels
- 2 packages sterile sponges
- adhesive plaster or bottle of flexible collodion
- 3 finger bowls containing
  - (1) soapy solution
  - (2) sterile water
  - (3) corrosive sublimate 1–2000 or corrosive alcohol
- receptacle with absorbent cotton in bottom, containing 3 sterile test tubes labelled 1, 2, 3

novocaine, 1%, and sterile 2 c.c. syringe
glass manometer and its attachments to test the spinal fluid pressure
half sheet and rubber, and 1 or 2 small blankets
30 c.c. glass syringe

If serum is to be given, the tube containing it is placed in a glass of water at 104° F. to warm.

The lumbar puncture needles and manometer are added to the equipment by the doctor.

Preparation of patient

Slip half sheet and rubber under the patient, part under the sacrum and the remainder hanging on the edge of the bed. Arrange the nightgown securely about the shoulders, quite out of the way, and drape with small shoulder blankets, permitting the full exposure of the spine in the lumbar and sacral regions, including the crest of the ilium.

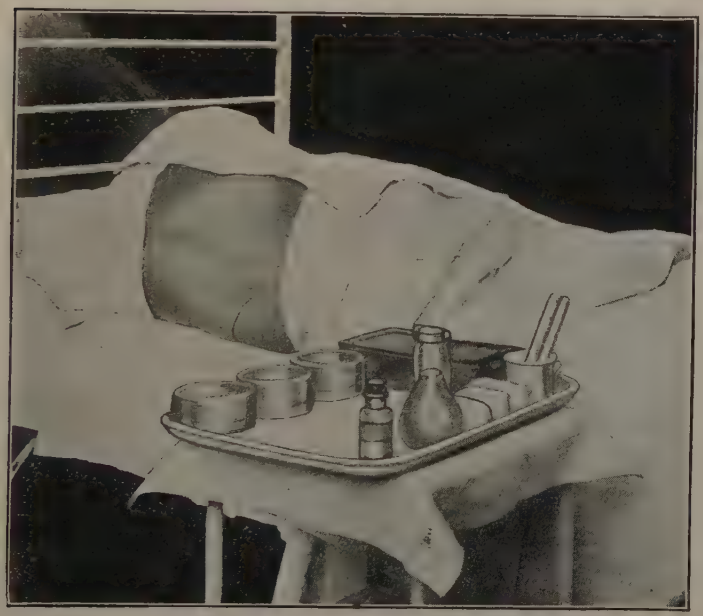
Local preparation of the skin

The technic of this procedure should be carried out as thoroughly as any aseptic surgical operation. Scrub the patient's back with soapy solution, sterile water and corrosive sublimate, from the beginning of the lumbar curve, down to the upper sacral, and well beyond the crest of the ilium. Drape above and below the site of operation with sterile towels. The puncture is usually made between the fourth and fifth lumbar vertebræ.

Position of the patient

The patient is on the left side as a rule, with hips near edge of bed or table, knees drawn up as high as

possible, so that the thighs are flexed against the abdomen, hands lightly clasped about the knees, head bent down towards the knees, so as to obtain the maximum



PATIENT PREPARED FOR LUMBAR PUNCTURE

bowing of the spine, to aid in the successful introduction of the needle between the separated vertebral spaces into the spinal canal. The position of the patient is most important, and will often determine success or failure. The most valuable aid the nurse can give the doctor is to reassure the patient and to see that this position is maintained. The nurse should, in a difficult

puncture, put one arm about the patient's neck, and the other about his knees, while on the opposite side of the bed from the doctor, in order to bring the head and knees of the patient still nearer. It will often make possible a puncture otherwise most difficult, especially in the case of a child.

Procedure

The novocaine is used as in cistern puncture.

When the needle is inserted and the manometer reading has been taken, the test tubes are presented in the order of their numbers and the manometer is tipped down so that the fluid flows out of the top into the test tube. This, when filled, is placed in upright position in the receptacle provided. After each withdrawal of fluid, the manometer reading is noted by the doctor and mentioned to the nurse (this provides a check on his memory), and the next tube in number is presented. When the operation is completed and the needle withdrawn, a sterile sponge is applied, and held in place with a strip of adhesive plaster or a collodion dressing.

After care

Following a lumbar puncture, the patient should be carefully observed. If he should complain of headache, the doctor should be informed, when he may prescribe ten grain doses of aspirin, given in hourly periods, for three doses. This medication will usually relieve the patient's headache.

In order to aid gravitation of the spinal fluid to the

brain, unless the doctor requests otherwise, the patient should always be kept flat, without pillows, for six hours. In some cases a four hourly chart is kept for a day or two, for purposes of observation.

L

PARACENTESIS

THORACENTESIS

Thoracentesis, or chest tapping, is the act of puncturing the chest wall with a long hollow needle or trocar for the purpose of exploration, for diagnosis, or for the evacuation of effusions from the pleural cavity.

Equipment

shoulder blanket
adjustable bedside table, if the patient sits up for the operation
half sheet and rubber
dressing tray with 3 glass finger bowls of solutions for cleansing and disinfecting the skin
3 sterile dressing towels
3 packages sterile sponges
1 hemostat
30 c.c. syringe with a small and long needle
2 sterile test tubes in a retainer, with absorbent cotton on the bottom to prevent breaking and to hold them upright, labelled, and bearing name of patient, ward, service, and "chest"
1 clean test tube containing potassium oxalate (about 4 grams), to prevent fluid from clotting, in order to count cells
bottle of flexible collodion
adhesive plaster

novocaine, 2%, and sterile 2 c.c. syringe
hypodermic syringe with caffeine sodium salicylate, usually 5 to 10 grains, in case of sudden respiratory distress

Procedure

Preparation of patient

The nightgown is removed and the shoulder blanket

PATIENT PREPARED FOR ASPIRATION OF CHEST

applied to cover the patient's chest and to leave the back partly exposed from neck to waistline. The half sheet

and rubber are placed upon the bed against the patient's back.

The back is scrubbed, and disinfected on both sides from the anterior axillary line of the side to be tapped to the angle of the opposite shoulder blade, and a sterile towel is draped over the shoulder.

Position

If the patient's condition permits, he sits up in bed, leaning forward with his arms extended upon a pillow on the adjustable bedside table, which is elevated as high as the patient's chest, so that his ribs are lifted and separated.

If the patient is unable to sit up, he is placed on his side, opposite the one to be tapped, near the edge of the bed, with a pillow under his chest to spread the ribs on the upper side. The upper hand is placed on the opposite shoulder and the elbow supported by pillows.

Site of puncture

The place selected by the doctor for the tapping is usually in the sixth, seventh, or eighth intercostal space, generally, directly under the angle of the scapula. The site of puncture, particularly if exploratory for encapsulated empyema, may be anywhere in the pleural cavity. Great care is exercised when regions of the pericardium, or anterior or posterior mediastinum are liable to be encroached upon. The needle is introduced near the upper margin of the lower rib in the intercostal space, since the intercostal artery runs along the lower margin of the ribs, and possibly may be punctured if the upper portion of the space is entered.

A wheal is made in the skin with novocaine and the subcutaneous and intercostal tissues infiltrated on either side. The sterile field is covered with a sterile towel and left on, while ten minutes is allowed for the local anesthetic to take effect.

When it has taken effect, the large needle on the end of the 30 c.c. syringe is slowly inserted between the ribs into the chest cavity, and if successful, 30 c.c. of the fluid is withdrawn. The nurse carefully removes the absorbent cotton plug from the test tube so that it does not come in contact with unsterile surfaces, and holds it to be filled from the syringe or trocar, then plugs the test tube and replaces it in the retainer.

ASPIRATION OF THE CHEST

Equipment and preparation

To the thoracentesis equipment add
special paracentesis or large caliber lumbar puncture needle
3-way stop cock and rubber tubing attachments
5-pint bottle

The same observations are made of the patient's condition as in the first operation. If he is nervous or apprehensive, morphine sulphate, 1/6 grain, is ordered to be given subcutaneously twenty minutes before the operation; and for emergency use, the hypodermic syringe is refilled with caffeine sodium salicylate, 5 to 10 grains, which can be administered intramuscularly should the patient faint or become dyspnœic.

Every effort should be made by the nurse to be matter of fact and keep the patient from becoming

fearful. His respiration should be kept uniform and the movement of the chest decreased as much as possible. Spontaneous coughing should be inhibited by the patient himself or by medication (chloroform lozenges, etc.). Severe pain and coughing are produced when the needle catches in the pleura. This may happen if patient moves or jumps unexpectedly, or sighs, yawns, or coughs.

Procedure

The patient is prepared, as before, in the exploratory puncture. The paracentesis needle is then inserted so as to graze the upper surface of the lower rib and to extend well into the fluid cavity. The needle is then connected to the 3-way stop cock and 30 c.c. syringe, all of which are sterile. Several sterile test tubes can then be filled with the material withdrawn and suitable studies and cultures done. The outlet tube can be connected with a 5-pint bottle and the remaining fluid pumped into it by the syringe. Great care should be taken that air is prevented from entering the pleural cavity.

As a rule the fluid is withdrawn slowly. If the patient coughs while the fluid is being withdrawn, it is usually a sign that the lung which has been pushed up by the pressure of the fluid is coming down on the needle, and in order to avoid injuring the lung, the doctor waits before proceeding again, and if coughing persists, or the patient feels faint, the needle is withdrawn.

The puncture in the skin is covered with a collodion

dressing, or a sterile gauze sponge, held in place with adhesive strips. The patient lies down and is made comfortable and kept quiet. Observations of the pulse are frequently made, faintness and collapse watched for, because of the effect upon the heart and blood pressure, following removal of the effusion. Persistent coughing and raising of sputum are noted, the latter for air bubbles or for blood.

The gross description of the fluid in the bottle is made by the doctor and the amount measured by the nurse and recorded. If the whole amount is not to be saved, 30 c.c. of the fluid is secured for culture and laboratory tests.

PERICARDIAL ASPIRATION

Aspiration of the pericardium is usually an emergency operation and is done where the action of the heart is embarrassed by an excessive effusion of serous fluid within the pericardial sac, causing great distress to the patient because of the sense of pressure and fullness about the heart. For relief, the patient sits forward in bed with his head bent on his hands.

In the preparation of the skin a large area is prepared about the site of operation to permit a clean field for percussion during the withdrawal of the fluid.

Preparation

The preparation and equipment are the same as for pleural tapping, except that the area scrubbed includes the following:

From line of clavicles to line of umbilicus and from right nipple line to left posterior axillary line.

The patient should be on a head rest, with left arm raised, and if it is desired, held in position by the nurse.

ABDOMINAL PARACENTESIS

Abdominal paracentesis, or tapping, is an operation for the removal of ascitic fluid from the abdominal cavity for the purpose of study, diagnosis, or relief of pressure.

Equipment

shoulder blanket
stockings
half sheet and rubber
rubber sheet
blanket and wrapper
bath tub
5-pint bottle
dressing tray on which are 3 sterile test tubes in specimen glass, with cotton at bottom
3 sterile towels
3 packages sterile sponges
3 finger bowls
(1) soapy solution
(2) sterile water
(3) corrosive sublimate, 1–2000
novocaine, 1%, sterile 2 c.c. syringe, and needles
adhesive plaster
sterile trocar and cannula
12-inch piece of rubber tubing to attach to cannula

if needed to serve as an extension in draining off the fluid into the 5-pint bottle

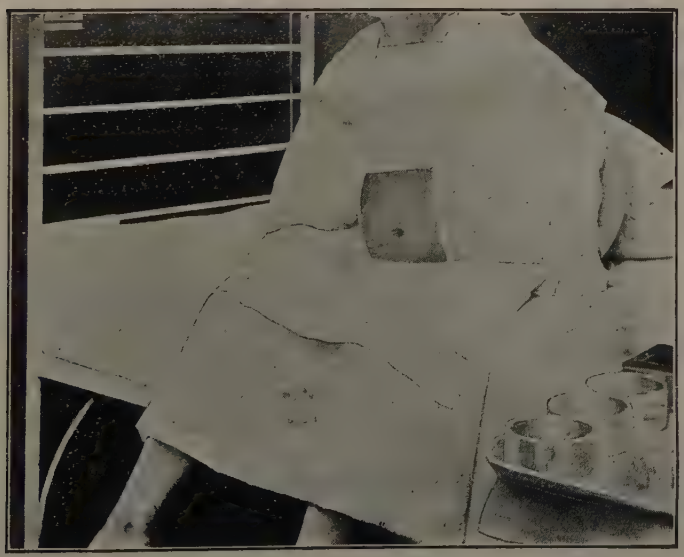
sterile scalpel

A small hypodermic needle and a larger intramuscular needle should be provided. All needles and syringes should be tested before sterilization.

Procedure

Preparation of patient

The bladder should be emptied. Put on stockings and wrapper. The patient should be seated in a comfortable armchair, or bolstered up on the side of the



THE PATIENT PREPARED FOR ABDOMINAL PARACENTESIS

bed. If in a chair, support the patient's back with a pillow, and drape the shoulders with a small blanket, leaving the abdomen exposed. Place a half sheet and rubber sheet on the patient's lap, a large rubber sheet on floor, and a large pail and 5-pint bottle within reach.

The patient's abdomen is thoroughly scrubbed by the nurse with soapy water, sterile water and corrosive sublimate (paying special attention to the pelvic region, just below the umbilicus). Sterile towels are draped above and below the area scrubbed.

Operation

The novocaine is employed as usual.

A slight incision is made with the scalpel by the doctor for the introduction of trocar and cannula. On the withdrawal of the trocar the nurse should be ready to catch the first few drops of ascitic fluid in a test tube. If necessary, the rubber tubing is attached to the cannula and the 5-pint bottle is placed in position for the remainder of the fluid.

Completion of operation

The cannula is removed and a sterile sponge and adhesive plaster are put over the wound. If there is much oozing, a large sterile pad and binder are applied.

The amount of fluid obtained is measured and recorded on the laboratory sheet by the doctor.

NOTE: The thorough emptying of bladder cannot be too greatly emphasized in this operation to avoid accidental puncture of the bladder.

LI

PREPARATIONS OF DRUGS AND THEIR MEDICINAL USES

The various forms into which drugs are made ready for use are classed according to legal standards.

LIQUID PREPARATIONS

Aromatic waters are aqueous solutions of volatile substances, such as camphor water, peppermint water.

Infusions are aqueous solutions containing the active principle of a vegetable substance, and are usually made by pouring boiling water on the vegetable substance and allowing it to steep for thirty minutes. Some are made by a cold process. Infusion of digitalis is an example.

Decoctions are aqueous solutions containing the active principle of a vegetable substance and are made by boiling the drug with water from twenty minutes to one hour because of the harder or denser nature of the drug, as decoction of couch-grass. Official in the British Pharmacopœia.

Tinctures are alcoholic, hydro-alcoholic or hydro-alcoholic glycerinated preparations, made by extracting the active principles of a drug by percolation or maceration, or both. The preparation is usually 10% strength. For example, tincture opium, tincture digitalis.

Spirits are alcoholic solutions of volatile substances. For example, spirits of peppermint, spirits of nitre.

Fluid extracts are alcoholic, hydro-alcoholic or hydro-

alcoholic glycerinated preparations, made by extracting the active principles of a drug by percolation, maceration, or both. The preparation is 100% strength; each c.c. representing the activity of 1 gram of drug. For example, fluid extract cascara sagrada.

Elixirs are preparations containing alcohol, water, glycerine, sugar and aromatic oils. They are used entirely as vehicles. For example, aromatic elixir, elixir orange compound.

Mixtures are a class of preparations in which insoluble substances are held in suspension by the aid of gum, syrup or some other viscid substance. For example, compound mixture licorice.

Emulsions are preparations in which oil is held in suspension by the aid of acacia, tragacanth or some other gum. For example, emulsion cod liver oil.

Solutions are preparations made by dissolving non-volatile substances in water or other suitable solvent. For example, solution potash, solution iodide potash.

Glycerites are made by combining medicinal agents with glycerine. For example, glycerite of tannic acid, glycerite of boric acid.

SO-CALLED SOLID PREPARATIONS

Extracts are a class of preparations prepared by exhausting the active principles of a drug in a suitable menstruum and concentrating the product into a powder form or a solid of a pillular consistence. Extract licorice.

Cerates are made by combining a drug with paraffine wax or fats; the idea being to get a preparation that will soften at the temperature of the body but will not

melt, and that is intended to act as a protective, at the same time keeping the medicinal agent in contact with the skin. For example, resin cerate, cerate cantharides.

Ointments are combinations of a fatty nature, containing sometimes lanolin, lard or petrolatum, or a combination of two or more of the above items combined with a medicinal agent. They are usually intended to melt at the temperature of the body. Some are applied by inunction and others are smeared on the skin. For example, mercurial ointment, boracic acid ointment.

Pills are preparations of medicinal substances in spherical or oval shape. They may be coated with sugar, gelatine, gelatine compound, and range in size from 1 to 5 grains. For example, Blaud's pill.

Tablets are usually disc-shaped and contain medicinal agents combined, and are coated with chocolate or sugar. They range in grainage from 2½ to 10 grains. They are of different types, depending on the character of the medicinal agent. There are three kinds of tablets: compressed, triturate and hypodermic. Compressed tablet: compound cathartic. Triturate tablet: rhinitis. Hypodermic tablet: morphine sulphate.

Lozenges are listed in the U. S. Pharmacopœia as **Troches** and are made by combining medicinal agents intended to be dissolved in the mouth in order that the agent may act on the mouth or throat. One of the very common types is that known on the market as the chloroform lozenge; another example is troches of tannic acid.

Suppositories are made by combining a medicinal

agent with cacao butter or with modified boro-glycerine and moulded into the desired shape to suit the orifice for which they are intended.

Capsules are gelatine cases used for the administration of drugs disagreeable to the taste. The gelatine may be of the elastic type or hard. A common type of elastic capsule is the santol oil capsule.

Cachets or **Konseals** are made of starch and are intended to encapsulate medicinal drugs having a very disagreeable taste. In the presence of moisture they collapse to a certain degree and are very easily swallowed.

Ampules are glass containers holding liquid medicinal agents in sterile condition. Commoner kinds are ampules ergot and ampules digifoline solution.

EFFECT, LOCAL AND SYSTEMIC

The therapeutic effect of drugs upon the body may be produced locally, that is, by direct application of a medicine to the part where the action is desired; or systematically, when the required effect is to be produced on a part away from the point of administration.

Locally, drugs may be used on the skin, as by plasters, liniments, counterirritants; or on mucous membranes, as by irrigations and gargles.

For *systemic* or general effects, the methods of giving vary according to the rapidity of action required, and the effect of the drug.

ADMINISTRATION

Channels of administration

Subcutaneous, when the effect of the drug is desired

immediately, for example, caffeine as an emergency stimulant.

Intramuscular, when the drug is irritating to the subcutaneous tissues, as Hayden's solution.

Intravenous, when it is advisable to get the drug directly into the blood stream, as salvarsan.

Intraspinal, to affect the central nervous system, as in the giving of sera, antitoxins or arsphenamine. See Chapter XLIX.

By mouth, as pills, capsules, solutions and powders.

By inhalation, for effect upon the respiratory system, as tincture of benzoin, or amyl nitrite. See Chapter XXXIII.

By rectum, when the drug has a disagreeable odor or taste, such as paraldehyde, or when an intestinal medication is required.

Medicines act more readily and powerfully when given by mouth than when administered by rectum; still more when injected under the skin, and most powerfully when given intravenously.

Conditions that modify dosage

The activity of a drug may be increased or lessened by age, sex, idiosyncrasy, as well as by condition of digestion and ability of absorption, by disease, and by the manner of administration. All of these things should be considered in relation to dosage.

Age. Children and old persons are more readily influenced by most drugs, particularly narcotics, than adults in the prime of life; but as a rule they bear larger proportionate doses of purgatives.

Sex. Men generally bear larger doses of medicines than women.

Idiosyncrasy. Many persons manifest peculiarities with respect to certain drugs. Some are susceptible to the poisonous effects of arsenic or phosphorus. Others cannot tolerate belladonna or iodides. Some are very susceptible to the action of cocaine when applied to the mucous membrane in a very weak solution.

Habitual use. When a medicine is taken over a long period the system becomes tolerant to it, which means that larger doses must be given to get the desired effect. This is especially the case with purgatives and some opiates.

Cumulative effect. Drugs that are rapidly absorbed and slowly eliminated may produce a cumulative effect. This may happen also with patients whose vitality is very low and their power of elimination rather slow.

Toleration. During digestion larger amounts of medicines are borne than can be taken when the stomach is empty. In certain conditions of the alimentary canal, as in cholera, during congestive chill of gastric enteric variety, or during profound opium narcosis, absorption from the stomach is slow, if it takes place at all. In certain diseases great tolerance is manifested to medicines; thus in peritonitis large doses of opium are taken with advantage. In typhoid fever the tolerance to alcohol is marked.

Method of administration

The method modifies the effect to a greater or less degree. The therapeutic action of a drug may be de-

stroyed by the method in which it is prepared and given to the patient. In order to give drugs intelligently, knowledge of their effect is essential to obtain the desired effect. The following points should be remembered when giving drugs by mouth:

Saline cathartics should be given on an empty stomach, preferably before breakfast, because of the short time required for their action. They should be well diluted except in cases of edema, when it is necessary to rid the body tissues of water. They act more powerfully when concentrated.

Other cathartics are given late in the afternoon or evening, depending upon the time required for their action.

Diuretics act more powerfully when diluted.

Oils should never be given directly after meals, as they may interfere with digestion. The taste of castor oil may be disguised by giving it between layers of orange or lemon juice, or by adding a pinch of soda bicarbonate to the mixture at the bedside. Sometimes it may be given in carbonated waters, as Vichy. This breaks up the globules of oil and makes it easier to swallow. Or the taste buds may be dulled by eating cracked ice before the oil is administered.

Pills may be given by placing back on the tongue, or by putting them in bread or jelly, and following by plenty of water to supply the fluid necessary to dissolve the pill and make it ready for absorption.

Powders with disagreeable tastes are given in capsules. Others should be dissolved in hot milk, as veronal, to help its sedative action; or in cold water,

as seidlitz powders. Those which do not dissolve readily in liquids, as compound licorice powder, may be made into a paste and given with a teaspoon, followed by the drinking of water.

Iron and *acids* should be given through glass drinking tubes to prevent destruction of the teeth.

Tonics, which are given to improve the digestion, are best given before meals. They may be diluted, but not enough to disguise their taste, as their action depends upon the bitters which they contain.

Drugs that are irritating to the mucous lining of the stomach should be diluted more than any others, and are best given after meals, when there is food in the stomach, as this tends to lessen the irritation.

Cough mixtures are soothing to already irritated mucous membranes, because of the syrup which they contain, and in this way tend to relieve the spasm of coughing, therefore they should not be diluted. All other liquids may be diluted.

In giving *hypnotics,* the patient should be made comfortable first, and then the drug given early enough to produce sleep at the required time.

Patients who are able should not be permitted to walk to the operating room following their preoperative dose of morphine, but should be kept quiet, as the activity may offset the desired effect of the drug.

Dosage for children

It is often necessary to determine the dose of a drug suitable for children according to their age. This is commonly worked out by Young's rule.

Rule: For children 1 to 12 years of age:

$\frac{\text{Age of child in yrs.}}{\text{age} + 12}$ Reduce this fraction to lowest terms, and take this fractional part of the adult dose.

Example: Adult dose of paregoric is 1 dram. How much would you give to a 4 year old child?

$$\frac{4}{4 + 12} = \frac{4}{16} = \frac{1}{4}$$

Adult dose = 1 dram or 60 minims.

Therefore, $\frac{1}{4}$ of 60 = 15 minims.

Rule: For children under 1 year of age:

$$\frac{\text{Age of child in months}}{150}$$

Example: Adult dose of paregoric is 1 dram. How much would you use for a 5 months' old child?

$$\frac{5}{150} = \frac{1}{30}$$

Adult dose = 1 dram or 60 minims.

Therefore $\frac{1}{30}$ of 60 = 2 minims.

Abbreviations

Written orders for medicines make it necessary for the nurse to understand and interpret correctly the following abbreviations, which are some of those most commonly used and have to do with how and when drugs are to be given:

ā ā	ana	of each
a. c.	ante cibum	before meals

ad		up to
aq.	aqua	water
b. i. d.	bis in die	twice a day
$\overline{c}$	cum	with
c.c.	centimeter cubicum	cubic centimeter
dr. ʒ	drachma	dram
gm.	gramma	gram
gr.	granum	grain
gtt.	gutta	drop
M.	misce	mix
m.	minimum	minim
o. d.	omni die	daily
oz. ℥	uncia	ounce
p. r. n.	pro re nata	whenever necessary
p. c.	post cibum	after meals
p. o.	per os	by mouth
q. h.	quaqua hora	every hour
q. 2h.	quaqua dua hora	every two hours
q. 3h.	quaqua tertia hora	every three hours
q. s.	quantum sufficit	quantity sufficient
s s	semi	one-half
$\overline{s}$	sine	without
s. o. s.	si opus sit.	when occasion arises
stat.	statim	at once
s. c.		subcutaneously
t. i. d.	ter in die	three times a day

Weights and measures

The apothecaries' and metric systems are those which are commonly used in pharmacy for weighing and measuring. The tendency now is more towards the

use of the latter, because it makes possible a common scale for measures of length, weight and capacity, and also because of its simplicity and accuracy in use, as it is a decimal system resembling ours of coinage.

The unit of length is the meter.

The unit of weight is the gram.

The unit of volume is the cubic centimeter.

Any fractional parts of a unit are expressed by the prefixes: deci, which means 1/10 of the whole unit, and is written in metric terms as 0.1; centi, which is 1/100 of a unit, and is written 0.01; and mille, which is 1/1000 of a unit, written 0.001.

To express terms larger than one unit, the prefixes: Deka, meaning ten; Hecto, meaning one hundred; and Kile, meaning one thousand whole units, are used.

By understanding these prefixes, any metric table may be easily formed by using them with any desired unit.

Metric terms are easily remembered and read if it is understood that numbers on the left of a decimal point correspond to dollars or whole units, while those on the right side are read as fractional parts of that dollar. For example, we write $2.75 and read it as two dollars and seventy-five cents. Removing the dollar sign, if the unit were grams, the numbers would be read, two grams and seventy-five centigrams.

Metric terms are always understood to mean grams for solids and cubic centimeters for liquids unless otherwise specified.

Equivalents helpful in working out problems:

1,000 c.c. = 1 quart, approximately

500 c.c. = 1 pint, approximately
4 c.c. = 1 fluid dram, approximately
30 c.c = 1 fluid ounce, approximately
1 grain = 65 milligrams, written decimally 0.065
15 grains = 1 gram, approximately
1 kilo = 2.2 pounds

Problem

To digitalize a patient, 1½ grains for every 10 pounds of body weight is required. How many grams of digitalis will be needed for a patient who weighs 180 pounds?

1 grain = 0.065 milligram
½ grain = 0.033
1½ grains = 0.098 milligram or amount needed for every ten pounds of body weight.

If patient weighs 180 pounds, he therefore will require 18 times 0.098 or 1.764 grams.

The treatment book

This consists of a medication sheet for each patient, upon which are written all orders for treatments under these headings: the date, the order, the date the treatment is omitted, and the house officers' and nurses' comments.

These orders are usually written and signed by the doctor. Verbal or telephone orders may be recorded and signed by the nurse, and in parenthesis below should be included the manner of giving the order, and the nurse's signature. The doctor should then sign this upon his next visit to the ward.

Before giving any medication, a nurse should read carefully and understand the order as written on this sheet, to prevent any mistakes in the nature of the treatment or in the time for giving it.

When carrying out p. r. n. orders, the time at which the treatments were administered should be recorded in the column on "comments."

All p. r. n. orders for morphine are by routine omitted at the end of seventy-two hours, and should never be given after that time, until a new order has been written by the doctor.

At midnight, the night nurse goes through the treatment book, and rules a red line across each page, just below the orders that are written on that day.

Card system

For accuracy in pouring and administering a dose of medicine, small cards of various colors are used. That is, all medicines written on green cards are given three times a day, those on yellow cards are given before meals, those on orange cards are given after meals, while any special medicines which are given at any other times than indicated above are written on white cards.

On each medicine card is written the patient's name in full, the name or number of the drug, the dose, how it is to be given, and at what time.

All cards of the same color are held together by a rubber band. A card is placed on top of each package by the nurse in charge, which tells how many there should be of that color, and the date upon which they

were counted. They are looked over daily, and are kept in a special box for use.

When the medicines are to be poured, the cards are counted to see that none are missing. Then they are spread out on the shelf, and arranged so that the same medicines are grouped together. This saves time in the end, as all medicines of the same kind may be poured at once, which otherwise would necessitate the taking and returning of that bottle to the shelf several times.

After pouring each medicine, the card is placed on top of the cup. When they have been given, the cards are placed on the head nurse's desk, and she, after looking them over, returns them to the medicine box.

Responsibilities of the medicine nurse

The nurse who has had this special duty assigned to her is made responsible for the following:

The care of the medicine closet.

To see that at 7.30 A.M. all empty bottles are put into the apothecary basket which need to be refilled for use that day, with the exception of those which contain alcohol and narcotics. These have to be taken to the apothecary in person.

Drugs which deteriorate and are unfit for use after a certain time are labeled "return to apothecary" and dated. The nurse should see to it that these medicines are returned on the date required. If they are still needed on the ward, write "refill" on labels, and "returned" if they are no longer in use.

All medicines not in use when patients are discharged should be marked and returned also.

All drugs used on the wards which are reportable and come under the Harrison Act, such as opium, cocaine, or their derivatives, should be checked daily on the proper charts, and report made to the head nurse of any that are missing.

See that there are no unlabeled medicines.

Dispensing medicines

Besides the necessary qualification of a sound working knowledge of arithmetic and materia medica, the nurse who dispenses drugs should also have a clear understanding and a strong sense of responsibility toward this important duty, characterized by punctuality, concentration, accuracy, interest and refined habits of cleanliness.

The nurse whose duty it is to dispense the drugs should not be called on to do anything else, or in any way be disturbed, until this duty is completed.

General rules

Start in time, and with clean hands.

Utensils used in dispensing medicines must be surgically clean.

Give the exact dose as prescribed. When minims are ordered, give minims and not drops, as the latter vary with the weight of the solution and the size of dropper used. If there is any uncertainty about the interpretation of the order or the fraction of the dose, take no risk. Consult the one in immediate authority. It is the patient who suffers when an error is made.

In dispensing any drug, read the label three times: on removal from the medicine closet; before pouring or dealing out; and before returning drug to medicine closet.

If a solution, shake the bottle before removal of the cork. Avoid pouring on the label side in all cases.

A patient should never under any circumstances carry a medicine to another patient.

All drugs should be actually administered by the nurse to the patient, and not be allowed to remain at the patient's bedside, to be taken at his own discretion.

Be sure that the right patient receives the right drug. If an error has been made, do not alarm the patient, but report *at once* to the one in authority.

Forgotten doses are reported. The drug ordered by the doctor for his patient to be given at certain hours should be of sufficient importance to be remembered. To the patient such an oversight is annoying and creates in him a critical attitude and loss of confidence in the nurse. In some cases a patient may feel that his recovery has been retarded by the omission of a dose of medicine.

Display interest in the act of giving the medicine. Our behavior towards our patients plays an important part in the psychic influence. It makes a difference whether the dose of medicine is passed to the patient in silence, with an air of languid indifference, or with an alert, sympathetic interest. A dose of medicine is generally of importance to the patient, as one may learn if it has been overlooked.

The medicine closet should be kept locked, and the

key kept in the head nurse's desk. At night the nurse on the ward should carry the key about her person, and remember to return it to its customary place before going off duty in the morning.

Sterilize medicine cups and glasses after use.

Graduates and medicine droppers should be washed in a hot soap solution, rinsed and dried. When drying a minim graduate, screw the corner of the medicine towel firmly into the bottom, so that all sediment may be dislodged.

Equipment for dispensing medicines

pitcher of cold water
medicine cups, glasses or paper drinking cups
ounce graduate
minim graduate
medicine droppers
teaspoons for pills and powders
measuring cup for seidlitz powders
glass stirring rod
glass drinking tubes
moist pieces of gauze for wiping mouths of bottle
medicine towel
medicine cards
hypodermic syringe and needle

Method of pouring liquid preparations

Grasp the bottle on the label side with the right hand, remove the cork with the side of the small finger of the left hand or between the fourth and fifth fingers, with the back of the fingers directed towards the cork. Pour the dose by holding the body of the bottle easily within the grasp of the fingers.

Hold the graduate upright by its base with the left hand so that the scale is in full view when held on the level of the eyes.

Pour slowly into the graduate until the amount needed is indicated by the numbered scale and line when the graduate is held straight. To avoid defacing the bottle, the final drop is caught on the edge of the graduate, or with an upward twist of the mouth of the bottle. The graduate is put down, and as the cork is being replaced, the label of the bottle is read for the third time, and the bottle is replaced in the medicine closet.

In all cases in pouring medicines hold the cork, so that it becomes a habit. If put down, it is apt to roll on the floor, when it is unfit to replace, or it may be lost.

All liquid preparations of drugs should be tightly corked because of the danger of evaporation and deterioration.

LII

SUBCUTANEOUS AND INTRAMUSCULAR INJECTIONS

Subcutaneous injections

A subcutaneous injection is a method of introducing special preparations of drugs directly into the subcutaneous tissue to be absorbed into the circulation. The purpose of this method is to obtain quick and sure action.

The classes of drugs most commonly used are cardiac and respiratory stimulants, narcotics and sedatives and insulin. They are prepared and put up in small effective doses containing the active principle of the drug, in the form of sterile solutions in soluble tablets, or sealed in ampules.

In order to avoid large blood vessels, the points of injection are in the outward exposure of the extremities —as over the triceps muscle or over the deltoid; in a thin person, in the front of the thigh, over the quadriceps, or into the loose connective tissue of the body, beneath the breast or shoulder blade.

In giving insulin, the needle is injected at an accentuated 45° angle, a little deeper than the subcutaneous tissue, but not into the muscle.

Intramuscular injections

This method is usually prescribed for the introduction of irritating drugs directly into a large muscle,

for immediate absorption. A slightly larger and longer needle is used, which is directed almost vertically into the muscle. The point of injection may be the gluteal muscle, at the prominence of the buttock, or in the quadriceps, front of the thigh. Except for the method of introducing the needle, the same routine is carried out as in subcutaneous medication.

Equipment

tray set up with
- drugs in solution and tablet form in fractional doses
- covered glass museum jar with sterile gauze sponges in 70% borated alcohol
- straight forceps in 70% alcohol
- 2 syringes, 1 glass 2 c.c., 1 metal 25 minim, the latter kept in 95% alcohol, with cap removed
- sharp needles to fit, threaded with fine wires
- dessert spoon or needle sterilizer
- bottle of fresh distilled water
- tincture of iodine
- spirit lamp
- box of matches

Metal syringe

The parts of an ordinary syringe are: (1) a barrel, which will hold 25 minims when full, with a short projection on the end; (2) a piston on which is engraved the minim scale; (3) a washer of leather or rubber; and (4) a metal cap. The piston fits snugly into the barrel of the syringe and acts as a propeller in dis-

charging its contents. It is held in place by a band which screws onto the barrel. The washer fits the end of the syringe, securing tightness when the needle is in place, and preventing leakage. The metal cap screws on and covers the open end of the syringe, preventing dust from getting into the barrel.

Procedure

Materials should be in readiness on each ward. The syringe and needle should be in perfect working order, ready for emergencies. The hands should always be washed before beginning, except in emergencies, when time counts.

Removal of sponge from jar

Remove cover from jar and invert on tray. Grasp a sponge with the sterile forceps, squeeze out the alcohol by rolling sponge against the inside of the jar, and place upon the inverted cover.

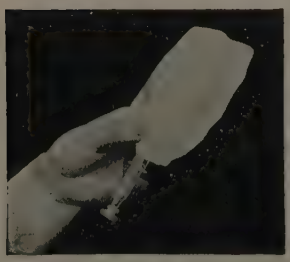
Preparation of needle

Light spirit lamp. Place needle, without removing the wire, in a clean dessert spoon, with its hilt toward the handle of the spoon. Uncork the bottle of distilled water, cleansing the mouth by letting some of the contents run over its edges, then pour enough over the needle to cover it completely. Boil the water over the flame one minute after the boiling point has been reached. Place spoon on tray with handle supported by the edge. Remove needle with forceps and transfer to the sponge. Remove syringe from glass receptacle and drive out alcohol by moving plunger back and forth,

then fill with sterile water from spoon. Extinguish light.

Preparation of drug

If a tablet, note if the fraction of the dose on the label corresponds with that of the dose ordered. If so, drop the tablet directly from the vial into the sterile spoon, otherwise work out the problem before starting operations. Hold the syringe upright and slowly expel water until the desired amount, as indicated by the scale on the piston, has been reached; fifteen minims is usually sufficient to dissolve the tablet and dilute the drug for ready absorption. Less may interfere with absorption because of the sugar of milk in the tablet. More is apt to cause unnecessary pain from subcutaneous pressure. Empty the syringe over the tablet. Stir with the tip of the syringe until dissolved, then draw up the solution slowly. To avoid charging with air, do not pull the piston beyond the scale of the prescribed amount.



METHOD OF CARRYING SYRINGE TO BEDSIDE

Attachment of needle and final procedures

Without touching the needle, it is picked up by its hilt. The wire is withdrawn and the needle securely screwed on to the barrel of the syringe, which is held needle end upward. The air is then expelled by pushing the piston upward until a drop of the solution appears at the point of the needle. Enclose the needle

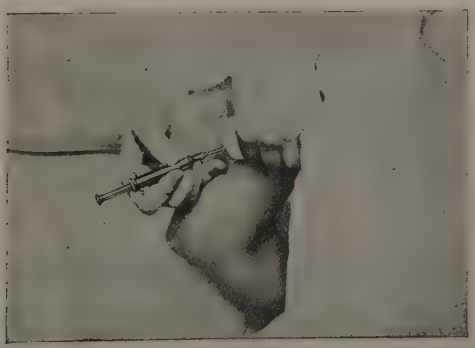
end of the syringe within the sterile sponge and carry to bedside.

Preparation of the skin

Withdraw the syringe from the folds of the sponge and hold it horizontally between the first and second fingers without touching the needle or the piston. Holding the sponge in the other hand, rub briskly with it at the point of injection until the skin is red, which aids in absorption and lessens the sense of pain; then stretch the skin and grasp a fold of the muscle.

Insertion of the needle

Hold the needle at an angle of 45° to the skin at the site of injection and direct the needle point upwards



INSERTION OF THE NEEDLE

into the subcutaneous tissues or muscle. Quickly puncture the skin in the area chosen and direct the needle to the desired location with one smooth movement. Inject the contents of the syringe into the subcutaneous

tissues or muscle by slow and steady pressure on the piston, with the tip of the index finger or thumb. Pause a few seconds, to await absorption, and then withdraw the needle quickly with one movement of the hand, keeping firm pressure the while with the sponge over the point of insertion. This prevents the leakage of any of the injected material. Gentle massage for a few seconds with the sponge immediately after withdrawal of the needle aids in more rapid absorption of the drug.

Record the drug, dose and time, in writing, in the proper place, as directed.

After care of syringe

Remove the needle from the syringe and fill the barrel with 95% alcohol from the container. Replace needle and force out alcohol. Repeat this operation at least twice. To prevent rusting, detach needle, insert wire, place in spoon and dry over alcohol flame, or draw wire in and out several times, wiping it each time. If the needle is not in frequent use, run wire through boric ointment before inserting. Dry piston and barrel and replace in alcohol. When sterilizing a syringe, remove the piston from the barrel, wrap both in gauze, and tie with a bandage, allowing the end to hang over the edge of the sterilizer for easy removal.

Precautions to observe

A deep-seated abscess may be the result from such conditions as: (1) an unsterile needle, (2) unclean skin at point of insertion of needle, (3) unclean hands, (4) de-

composed solution of a drug, (5) tablets not thoroughly dissolved, (6) an unabsorbed drug in conditions of weakened circulation, (7) or an irritating drug.

Do not wiggle or move needle around after piercing skin. Most needles break at the shank, because of lateral or bending pressure, and should be tested before injection, by light pressure upon the sterile gauze.

Needles are apt to break if blunt or corroded; if directed into the tough, loose skin of an elderly or emaciated person; if a bone or tendon is struck; if attempts are made to introduce the needle unawares; if an injection is given to a struggling patient, without help. If a needle should break under the skin, surround the spot of entrance at once with pencil or iodine. Save the remainder of the needle. Do not alarm the patient. Do not rub the spot. Report.

A large blood vessel or nerve may be punctured if the needle is directed towards the inner surfaces of the arms or legs.

Unnecessary pain is caused if a blunt, coarse, or rusty needle is used; if introduction is too slow; if syringe is handled unsteadily after the needle has punctured the skin; if the angle of the needle is too slanting; if the quantity of the solution is too large; if drug is injected too quickly; if given too superficially, when an irritating drug is used.

Method of filling the syringe with different preparations of drugs and sera

Solutions for subcutaneous injections are sterile preparations of distilled water and a drug of a certain

strength to a given proportion of water. In filling the syringe, the sterile needle is thrust directly into the solution, avoiding the mouth and bottom of the bottle. The required amount is drawn into the syringe, plus one minim, to allow for loss when expelling the air. The bottle is immediately covered after withdrawing the needle.

Sera or vaccines and insulin come prepared in small glass vials or bulbs. The mouth is covered with a rubber diaphragm, which is a form of stopper, and is disinfected before using by dipping in a bowl of 70% alcohol or tincture of iodine. The content is removed by thrusting the sterile needle of the syringe through the rubber, and with the vial inverted, the content is drawn into the syringe.

When filling a syringe from an ampule, the ampule is dipped in 70% alcohol or iodine, and enclosed within the folds of a sterile gauze sponge or towel wrung out in the alcohol. The tip of the ampule is carefully broken off. The sterile needle is thrust within the opening, and with the ampule on its side or inverted over the needle, its content is drawn into the syringe.

Glass syringe

A glass syringe is made up of a barrel, piston and needle. On the side of the barrel is a scale indicating its capacity in the metric and apothecaries' systems. Syringes used for ordinary subcutaneous medication register 2 c.c. or 30 minims. The glass piston is detachable. The needle fits over the projecting tip of the barrel. About its mouthpiece is a small metal collar

and chain which keep the piston in place and steady the syringe while in use. The glass syringe is preferable to a metal one because of its simple construction, its greater capacity and ease of sterilization, as in the use of novocaine in operations when strict asepsis must be observed. Because of their fragility, however, glass syringes are not used commonly in some hospitals, but are reserved for the administration of special preparations of drugs containing mercury or iron, such as Hayden's solution or citrate of iron, because of the effect of the drug upon the metal syringe.

The method of using a glass syringe is the same as that of the metal syringe, except that the tablet of a drug may be dissolved directly in the barrel of the glass syringe, into which has been previously drawn or poured a small amount of sterile distilled water.

Method of sterilizing glass syringes

The glass piston and barrel of the syringe are enveloped separately in gauze and placed in the sterilizer in tepid water. They are removed five minutes after the boiling point has been reached. Following the use of the syringe in a case of an infectious disease or spore producing micro-organisms, it should be boiled fully twenty minutes or be autoclaved.

Fractional doses

Method of working out problems for subcutaneous medication

Drugs used for subcutaneous medication are prepared in tablet form or the drug may be in solution.

Problem 1. To prepare a dose of a drug from a tablet when the required dose differs from the strength on hand:

Example: Give atropine sulphate grains $\frac{1}{150}$ from tablets grain $\frac{1}{100}$.

Rule: (1) Make a common fraction of the two strengths, having the strength on hand as the numerator, and the required dose as the denominator.

(2) Reduce this fraction to lowest terms.

Example: Strength on hand = grain $\frac{1}{100}$.
Strength required = grain $\frac{1}{150}$.
Fraction = $\frac{100}{150}$ and
Reduced = $\frac{2}{3}$, which is the part of the whole tablet necessary to give the required dose.

(3) In order to get this fraction of a tablet accurately, it is necessary to dissolve the stock tablet in water. To do this, choose any number of minims which the syringe will hold, that can be divided evenly by the denominator of the above reduced fraction. A number whose fractional part does not give more than 15 or less than 10 minims for an answer is desirable, as this is the best amount of liquid to give subcutaneously, as it is better absorbed on account of the sugar of milk which the tablet contains.

(4) Example: Number chosen = 15 minims.
Dissolve the stock tablet in this amount.

(5) Dose required, according to above fraction = $\frac{2}{3}$ of stock tablet.

(6) Therefore, dissolve 1 tablet grain $\frac{1}{100}$ in 15 minims of water and take $\frac{2}{3}$ of 15, which equals 10 minims. This is done by expelling 5 minims from the syringe and the remaining 10 minims is the amount to give for the required dose.

Problem 2. To prepare a dose when more than 1 tablet is needed for the required amount:

Give atropine sulphate grain $\frac{1}{120}$ from tablets grain $\frac{1}{200}$.

According to rule: the fraction is $\frac{200}{120}$.

Reduced $= \frac{5}{3} = 1\frac{2}{3}$, which means that one whole tablet and $\frac{2}{3}$ of another have to be used in order to give the required dose.

Always prepare fraction of 1 tablet first, which in this case is $\frac{2}{3}$, by dissolving one stock tablet in 30 minims of water. Then $\frac{2}{3}$ of 30 = 20 minims. To this 20 minims add one whole tablet, as problem indicates, which gives the required dose.

Problem 3. To prepare a fractional dose when the drug is in solution: In this type of problem the label always tells the amount of drug that has been dissolved in a certain number of minims.

Example: The label on a bottle reads

MXII = grain $\frac{1}{30}$. How many minims would be necessary to give grain $\frac{1}{120}$?

Working out problem as for fractional doses from tablets,

Fraction $= \frac{30}{120}$ or $\frac{1}{4}$.

Then $\frac{1}{4}$ of 12 minims (because this is the amount of solution which represents grain $\frac{1}{30}$) = 3 minims or the required dose.

Problem 4. Method of preparing two different drugs to be given subcutaneously at the same time when both the strengths ordered differ from those on hand:

Example: The dose ordered is morphine sulphate grain $\frac{1}{12}$, and atropine sulphate grain $\frac{1}{100}$, to be given in 15 minims of water.

On hand are tablets of morphine sulphate grain $\frac{1}{4}$, and atropine sulphate grain $\frac{1}{100}$.

Rule: Follow that given under fractional doses to determine first the part of the stock tablet to use of each drug.

Example: $\frac{4}{12} = \frac{1}{3}$ of stock tablet of morphine necessary and

$\frac{100}{150} = \frac{2}{3}$ of stock tablet of atropine necessary.

Procedure

Boil water and needle in the usual way.

Measure 15 minims of sterile water from the spoon into a graduate and place to one side.

Fill the syringe again with 15 minims of water, from the spoon.

Empty the spoon and dry, if necessary, with a sterile sponge.

Drop the $\frac{1}{4}$ morphine tablet into the spoon and dissolve it with the 15 minims of water in the syringe.

Carefully draw up 5 minims of this solution, which gives the $\frac{1}{3}$ tablet, as required, and now equals $\frac{1}{12}$ of a grain.

Empty the spoon again and dry.

Drop the $\frac{1}{100}$ atropine tablet on hand into the spoon, and dissolve with the 15 minims of sterile water re-

served in the graduate. According to the problem, $\frac{2}{3}$ of this solution or 10 minims is necessary for required dose.

Then with the syringe, which now contains grain $\frac{1}{12}$ of morphine in 5 minims of solution, carefully draw up 10 minims of the atropine solution, which equals grains $\frac{1}{150}$, making a total of 15 minims. This is then given in the usual manner.

LIII

INTRAVENOUS OPERATIONS

Veins are opened for the removal of blood for various purposes and for the injection of a fluid directly into a vein for medication or infusion to increase the volume of the blood.

MEDICATION

The intravenous route is used in certain instances when it is desirable to obtain immediate results and full action of a drug. Drugs acting on the circulatory system are occasionally given this way. In certain cases of septicemia, following transfusion mercurochrome is injected as a 1 per cent solution in distilled water; it is also given in gonorrheal infection. Certain drugs, as arsphenamine (606) and its allied preparations, that are too irritating to be given subcutaneously and are not absorbed if given by mouth, are, as a rule, administered intravenously.

As an example of intravenous medication, the administration of arsphenamine and neo-arsphenamine is here described, when used for anti-syphilitic treatment.

Severe reactions occasionally follow the intravenous administration of anti-syphilitic remedies, so that only a doctor or a specially trained technician or nurse should carry out this procedure. In the great majority of cases no ill effects are obtained.

Gown and rubber gloves are worn by the doctor and his assistant.

Preparation of arsphenamine

Equipment

flask of freshly distilled sterile water
empty sterile flask
sterile filter paper
sterile funnel
pink litmus paper
sealed ampule in bowl of corrosive alcohol
small sterile steel file
small bottle of sodium hydroxide (15%)
bowl of soapy solution
bowl of corrosive alcohol

Concentration

The solution is made up in a concentration of 0.1 gram arsphenamine to 20 c.c. of freshly distilled water. The ampule is removed from the alcohol and held within the folds of a sterile sponge. A nick is made in the neck of the ampule with the sterile file and the top of the ampule knocked or broken off, and the contents, a yellow powder, is emptied into the flask containing the distilled water by tapping on the ampule with the file.

The flask is now gently rotated to dissolve the arsphenamine, but never shaken, for fear of gelatinizing the solution.

When the powder is completely dissolved, 3 drops of sodium hydroxide (15%) are added for each 0.1 gram of arsphenamine dissolved. The addition of the sodium hydroxide is for the purpose of neutralizing the arsphenamine.

The solution will at first be cloudy, then it becomes a transparent amber. The solution is tested with the pink litmus paper, and if alkaline in reaction, is then filtered through sterile filter paper and sterile funnel, when it is ready for administration.

Preparation of neo-arsphenamine

Neo-arsphenamine (the Greek prefix signifying "new") is a compound prepared from arsphenamine and, like arsphenamine, used chiefly for the treatment of syphilis. This drug is a yellow powder, which dissolves readily in distilled water and has a neutral reaction. Like arsphenamine, it is put up in sealed ampules.

Concentration

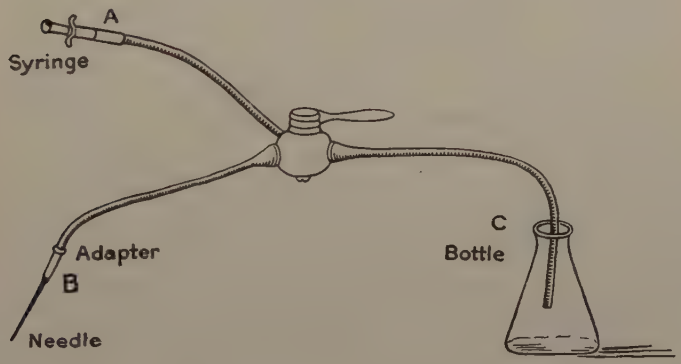
0.45 gram is generally dissolved in a sterile, wide-mouthed, 4-ounce bottle containing 20 c.c. of sterile distilled water. The bottle is agitated gently until the solution is clear. Sodium hydroxide is not required. It is not necessary to filter it, and if the solution is not clear or crystals remain undissolved, it is safer to discard this solution and make up another one. Sterile precautions are used as in the preparation of arsphenamine.

Administration of arsphenamine and neo-arsphenamine

On a table covered with a cotton and a rubber sheet is a pillow for the patient to recline on. The table should be of convenient height for the operator. The following equipment is placed upon an instrument table covered with a sterile half-sheet:

Equipment

A three-way stopcock with 3 small rubber tubes about 40–50 cm. long. On the end of one tube (*a*) is a 30 c.c. glass syringe; on another tube (*b*) an adapter, a small device of metal for connecting the intravenous needle to the tube; the end of the third tube (*c*) is placed in a small flask of sterile normal salt solution.



sterile sponges

light-weight rubber tourniquet, and a hemostat to hold it

250 c.c. sterile glass cylinder for the arsphenamine solution

Sharp intravenous needles are kept in 70% alcohol at one side.

If neo-arsphenamine is being used, it is withdrawn directly from the 4-ounce bottle in which it has been freshly prepared.

The entire apparatus used in the injection should be sterile.

Procedure

With the end of tube (*c*) in the flask of normal saline, the system of tubes is filled by manipulation of the syringe on tube (*a*) by adjusting the stopcock properly. The sterile needle is fitted to the adapter and a little salt solution washed through, about 5 c.c. being left in the syringe. The patient's arm at the bend of the elbow is cleansed with soapy solution and corrosive alcohol. The rubber tourniquet is applied above the patient's elbow and held with snug pressure by the hemostat. Avoid completely shutting off the pulse, as that would interfere with the operation of getting blood. The patient is instructed to close the fist, and if the vein is not in plain view, the operator slaps the area over the bend of the elbow two or three times smartly, when the vein will become prominent and venipuncture is more easily done. The operator holds the forearm with his left hand, drawing the skin down with his thumb, the needle is inserted, lifting the skin as it is punctured, and is directed into the vein slowly, to prevent going through the opposite side of the vein. After the needle is inserted well into the vein, the tourniquet is released and the patient relaxes his hand. 5 c.c. of the salt solution is first injected, to make sure that the needle is in the vein. Arsphenamine or neo-arsphenamine is very irritating to the tissues and causes pain and sloughing if given under the skin outside the vein.

Now tube (*c*) is transferred from the normal salt solution to the solution to be injected, and by the manipulation of the stopcock the arsphenamine solution is drawn into the syringe and then slowly injected into

the vein. All of the arsphenamine may not be given in one syringeful, but the amount can best be measured by reading the level of the solution on the scale of the cylinder. For example, to give 0.3 gram of arsphenamine, pump the solution from the arsphenamine cylinder into the vein until the level in the cylinder is reduced from 250 c.c. to 190 c.c., or until 60 c.c. have been given.

Tube (*c*) is returned to the normal salt solution and a little salt solution is injected into the vein in order to wash out any remaining arsphenamine solution into the vein.

The needle is quickly withdrawn and pressure made over the needle puncture with a sponge, and the patient is instructed to flex his arm for a moment. If bleeding has stopped, the sponge is removed and the puncture covered with collodion.

Patients who are undergoing routine anti-syphilitic treatment are questioned by the doctor as to their condition since the last treatment, for the occurrence of chills, and the skin is examined for a toxic rash before giving the next treatment. The patient's condition thus serves as an index for each treatment. Patients showing a reaction may be kept under observation in a hospital for a few days, if the reaction is a severe one. Adrenalin and sodium bicarbonate and sedatives are kept on hand where arsphenamine is administered for use in emergencies following medication. The reaction may occur as an immediate flushing of the face, dizziness, severe headache, a sense of tightness about the chest, nausea, vomiting, fever or collapse. Occasionally the

reaction is delayed for fifteen minutes to one-half hour. Weeks later more severe but rare symptoms, such as desquamation of the skin or jaundice, may develop after four or five doses of arsphenamine have been given to susceptible individuals.

Instruction to the patient

In order to help avoid a gastric reaction of nausea and vomiting following arsphenamine medication, the patient is instructed to eat a light breakfast, composed of a cup of black coffee and one or two slices of dry toast. No milk or eggs should be taken, as they are especially liable to cause nausea and vomiting after arsphenamine.

Food should not be taken for four hours following the treatment; rest and quiet also are important.

On the morning following the treatment a saline laxative should be taken.

VENIPUNCTURE AND VENESECTION

As an example of venipuncture for the withdrawal of small amounts of blood, the Wassermann test is described.

The Wassermann test

To secure blood for this test when syphilis is suspected and also as a guide in its treatment, venipuncture is frequently done by the nurse at the request of the doctor, if she has had previous experience.

Equipment

A small tray is set up with
- package of sterile sponges
- antiseptic alcohol, 70%
- flexible collodion and applicator
- half-inch rubber tubing tourniquet and hemostat
- 20 c.c. syringe
- needle, selected according to size of vein, attached to syringe
- sterile test tube or glass container labeled with the patient's name, date, ward, service and purpose of test

Avoid sterilizing needle and syringe in medicated alcohol, the ingredients of which cause hemolysis. If this method must be employed, the needle and syringe should be rinsed in sterile salt solution before withdrawing the blood.

Procedure

The site of puncture at the bend of the elbow is thoroughly cleansed with the 70% alcohol, and the tourniquet is applied to the arm above the elbow (see illustration, page 133), and either is tied with slight pressure or held in place with a hemostat.

After the tourniquet is on, if the veins are not prominent, the patient is directed to open and close his hand slowly and firmly. If that fails, the area may be slapped sharply, and often the veins will dilate enough to be visible. The operator holds the forearm with his left hand, drawing the skin down with his thumb, and inserts the needle slowly, lifting the skin, as before described.

As soon as the blood flows the tourniquet is loosened, and the necessary amount of blood taken. Before the needle is withdrawn a sterile sponge is held lightly over the needle, and is immediately pressed hard upon the site of the puncture on withdrawal of the needle. The patient is directed to flex his arm, thus making pressure. This prevents external bleeding and extravasation of blood into the tissues. When the bleeding stops, the puncture is covered with flexible collodion. The blood withdrawn is syringed out into the labeled container immediately, before coagulation takes place, and is sent to the laboratory for study.

When giving children the test, the blood may be removed from the jugular vein.

Venesection

The opening of a vein by incision for blood letting is known as venesection or phlebotomy. Venesection is resorted to when the vein is too small for a needle and when large amounts of blood are to be removed.

The operation is a delicate one and consists of dissecting the vein free and making a slight incision. The vein commonly selected is the median cephalic, or the median basilic, slightly below the elbow. A ligature is placed above and below the vein but not tied until the blood letting is completed.

Purpose

Venesection is sometimes done in conditions of uremia, in toxemia of pregnancy, and in high blood pressure, when as much blood as the patient can stand is with-

drawn. This is determined by blood pressure reading on the sphygmomanometer, and signs of collapse.

For relief in acute dilatation of the heart when there is unrelieved congestion and hypertension with pulmonary edema and dyspnœa.

In polycythemia, a condition when the red blood corpuscles are in excess of normal.

Equipment

A tray with
- 3 packages sterile sponges
- 3 sterile towels
- half sheet and rubber
- round enameled basin
- small bowl of alcohol, 70%
- novocaine, 1%
- iodine, 7%
- sharp scalpel
- surgical scissors
- forceps
- 2 Elsberg hooks to keep walls of veins apart
- 2 hemostats
- sterile syringes, 2 c.c., with needle for novocaine
- syringes, 30 c.c., for suction
- cannula with short length rubber tubing
- sterile 500 c.c. flask for blood
- light-weight, half-inch rubber tourniquet
- catgut ligatures
- horsehair suture and needles
- adhesive tape
- 2-inch roll cotton bandage
- sphygmomanometer

Duties of the nurse

Besides setting the tray, the nurse arranges the materials at the bedside, prepares the area at the bend of the elbow as outlined by the doctor, drapes the arm with a sterile towel above and below the point of operation. Especial care should be taken in preparing the skin, because of the nature of the operation.

Following the preparation of the skin, the novocaine is injected intradermally by the doctor.

The nurse may be asked to apply the tourniquet for engorgement of the vein, and to steady the patient's arm, which she does under the folds of the sterile towel, so that her hand may be out of the field of operation.

If the sphygmomanometer is used, she may have to observe the blood pressure readings.

If a large bleeding and the patient is apprehensive, he should be reassured, made comfortable and kept quiet. The patient's condition should be watched throughout the operation. When it is finished, the wound is closed with a continuous suture and a sterile dressing applied of gauze sponge and bandage.

The patient's general condition and pulse should be closely observed by the nurse following this operation.

LIV

PREPARATION OF PATIENT FOR X-RAY EXAMINATION

The diagnostic value of a roentgen examination depends in no small part upon the careful preparation of the patient, the removal of all clothing and dressings, in order to eliminate as much as possible any external obstacle to an accurate interpretation of the roentgenogram.

The nature and extent of the preparation of the patient depend on the part of the body to be observed.

One must bear in mind that all metals and metal-containing substances resist penetration by X-ray, consequently confuse or obscure the field under observation, frequently necessitating a repetition of the whole examination.

On the other hand, in an X-ray study of the hollow organs of the body, such as the gastrointestinal or urinary tract, certain metallic salts in solution are used in the examination to coat the walls of these organs and fix their outlines for identification. The substance used and method of administration depend upon the regions to be examined.

For study of the œsophagus and gastrointestinal tract, barium sulphate is more commonly used, given to the patient by mouth, a barium meal for examination of stomach and duodenum; or by rectum, a barium enema for examination of colon.

In the study of the urinary tract, cystoscopy is frequently followed by a pyelogram or radiographic picture. With the radiographic catheters in place, a solution of sodium iodide (12%) is injected, thus outlining the kidney, pelvis and ureter, and the pyelogram made before the opaque material flows out.

Procedures in various X-ray examinations

The following rules for the removal of apparel and other articles will serve for both outpatients and hospital patients incident to X-ray examination.

Head

Remove artificial teeth on plates, glass eyes; and with women patients, hairpins, combs, barrettes, earrings, necklaces, or beads.

Upper extremities

Bracelets and sometimes rings are taken off.

Chest

All patients having chest or gastrointestinal examinations should wear hospital clothing, including slippers, as it is necessary for the patient to stand for fluoroscopy.

Gall bladder, kidney, pelvis

Under ordinary conditions, there is no special preparation unless ordered by the doctor. The meal nearest the time of X-ray examination is omitted. At the time of coming for examination, the removal of corsets, waists, abdominal supports, or any article which may have metal parts, is required. If a binder is worn, it should be temporarily removed, when possible. Adhe-

sive plaster should be removed in so far as it is consistent with safety and the purpose which it serves. In this case, the roentgenologist or doctor would probably assume this responsibility, together with that of removing plaster of Paris casts or splints.

Gastrointestinal

No catharsis, enema, opiates, or atropine should be administered the day before examination. On the morning of the examination a drink of barium sulphate is given, usually at 8 o'clock, followed by a light breakfast (no meat or eggs). The patient is advised not to eat or drink again, except water, and then as little as possible, until after the first observation, which is usually 5 or 6 hours later. In the interval between the 6-hour and 24-hour observations, the patient may resume regular diet, but cathartics and other medication which might affect the intestinal motility should be withheld.

For an adult 4 ounces of barium should be mixed slowly with 8 ounces of potato flour gruel, or starch, until the consistency of thin cream, the gruel or starch acting as a vehicle for the barium powder, which is heavy and tends to settle in the drinking glass. Sometimes a tablespoonful of malted milk is added to give the mixture a palatable flavor. It is much easier to drink if taken through a glass drinking tube. In some clinics buttermilk or condensed milk is used instead of the potato flour gruel.

It is essential that sufficient barium mixture be given to fill out the stomach and duodenum. This mixture

is then carried along the intestinal canal by peristalsis, unless obstructed by disease.

If the first barium drink is not retained, this should be noted, and an attempt be made to repeat it, as the observation of the tract depends on the ingestion of the opaque meal for its visibility.

In certain instances of disease of the œsophagus or of lesions of the stomach with known obstruction, the barium drink is withheld at the discretion of the roentgenologist until the time of the fluoroscopic observation.

For study of the colon, there should be thorough evacuation of the colon by catharsis, preferably castor oil, the day before X-ray examination and a cleansing enema the morning of the examination, to eliminate as far as possible the presence of gas and intestinal contents. For Barium Enema, see Chapter XXV, page 158.

LV

SURGICAL NURSING

ADMISSION OF A SURGICAL PATIENT

See Part I, Chapter XXXV, page 232.

It should be remembered by the nurse that a patient who enters a hospital for a surgical operation arrives in the hospital ward in a more disquieted and apprehensive state of mind than the sick patient who enters a medical ward. The fact of an operation, no matter how simple it may seem to the nurse, stands between his possible return to his home and friends. The very atmosphere of a surgical ward may be suggestive. It is noticeable in many cases that the patient dreads the anesthetic more than the operation. The fear of not regaining consciousness seems to be predominant. In these experiences with the patients it is of great importance that the nurse should cultivate mental resources, a hopeful, comforting, reassuring attitude, with a sympathetic touch where depression of spirits and fear exist. A pessimistic state of mind on the part of the patient may counteract the otherwise successful outcome of an operation. A surgeon has been known to hesitate to operate on such a patient because of the possible serious results.

The temperature, pulse, and respiration are recorded and reported to the doctor, also the patient's general condition. With some exceptions a tub bath is made ready for all surgical patients who walk in. A bed bath

is given to a patient who walks in with a temperature over 99° or a pulse over 100, to a patient with a discharging wound, hyperthyroidism, or any other condition in which there is the slightest doubt in the mind of the nurse in charge as to the advisability of a tub bath.

A specimen of urine is sent to the laboratory on admission of the patient. No catharsis is given unless prescribed. To get accustomed to the use of the urinal before operation, male patients are required to use it while lying in bed. The same rule holds in the use of the bedpan in all surgical cases.

Physical examination and routine examination of the blood are made by the doctor.

All surgical patients go to bed and remain there until the doctor allows them to get up.

PRE-OPERATIVE DIET

With a view to minimizing the pains and discomfort following operation, the patients, before operation, are placed on a diet known as "pre-operative," which will be quickly absorbed and will leave very little residue in the intestinal tract.

This diet is given to all admissions to the surgical wards unless other special diet has been ordered. Pre-operative diet is much like the soft-solid diet, with certain omissions and additions which should be carefully noted. It is important that the patient should have no milk. Patients should be encouraged to drink water freely between meals. Patients with abdominal pain *have nothing* by mouth until seen by the doctor.

Breakfast

orange juice
soft cooked egg
toast with butter
tea or coffee, without milk

This is the same as the "soft-solid" diet sent from main kitchen, omitting milk and cereal; orange juice added.

Dinner

broth, without milk
chicken
toast and butter
mashed, steamed, or baked potato
tea, without milk
dessert, plain jelly

A small portion of each article should be served and only one helping given.

This is the same as the "soft-solid" dinner, substituting plain jelly as dessert, and omitting milk.

Supper

beef broth
soft cooked egg
toast with butter, and honey if desired, or orange juice
tea, without milk

It is not desired to keep the patient on this diet for more than two days. If the patient is brought into the hospital for observation and study over a longer period, the doctor is consulted as to suitable diet.

Pre-operative diet does not take precedence over any special diet ordered by the visiting surgeon or house-officer.

LOCAL PREPARATION

Supplemental to Part I, Chapter XXXVII, page 244.

Areas for shaving

Face

A woman patient does not have her face shaved, except when required about the margin of the hair.

The barber or orderly shaves the men.

Chest

The same treatment is required as in the preparation for breast operation, with the exception of shaving the arm.

Abdominal region. This includes gastric operations.

Prepare from the level, below the breasts, to, and including pubes, and to midaxillary line.

Inguinal region. Usually for inguinal hernia.

Prepare pubes on both sides from level of umbilicus to upper third of thigh. Omit alcohol on labia and scrotum.

Vaginal and perineal region

Shave pubes both sides, vulva, perineum and about 2 inches above the anus in the region of the coccyx.

Rectal region

Shave area 4 inches in diameter about anus. Do not shave pubes or vulva.

Extremities

Shave to level indicated by the doctor. See Varicose Veins, Part I, Chapter XXXVII, page 247.

Except when a dry shave is requested, the following method of preparing the patient serves in all ordinary cases. The field of operation is cleansed from extraneous

material from the sweat and sebaceous glands and dead skin cells, and thereby the danger of infection is lessened.

Equipment

small blanket
small tray
2 small bowls
warm soap solution
borated alcohol, 70%
kidney basin with toilet paper
razor box containing:
  safety razor and blades
3 packages sterile sponges
2 sterile towels
straight binder
2 perineal straps
8 large safety pins

An abdominal operation has been chosen as an example for procedure.

Procedure

In carrying on this procedure the nurse's sleeves should be rolled up above the elbows.

Open the packages of sponges and turn one into bowl of soap solution, the second into bowl of alcohol; the third package is opened, but sponges are left in their cover.

Shaving the patient

Fold back the bedclothing on level with pubes. Tuck a dressing towel over the edge of the bedclothing. Lather

the skin in the area of operation with warm soap solution, using a sterile gauze sponge. Shave, wiping the razor at intervals with toilet paper, which is deposited in kidney basin. Care must be exercised to avoid cutting or scratching the skin with the razor, as it leaves a sensitive surface for the remainder of the preparation, to the discomfort of the patient, and opens an avenue for infection of the surgical wound later. When the shaving is completed, the skin should be dried with a sterile sponge and inspected by the nurse for areas which may have been overlooked. Leave a soapy sponge over the umbilicus. The towel which protects the edge of the bedclothing is turned over the patient's abdomen for protection until ready for cleansing the skin.

Nurse's preparation

Lather and scrub arms, hands, and finger nails under hot running water, cleanse the finger nails with orange stick, and scrub again for two minutes. Then rinse under running water.

Preparation of patient

Complete cleansing the umbilicus with absorbent cotton swabs and soap solution. Scrub the shaven surface of the skin for five minutes with soap solution and sterile sponges from the umbilicus out in circles. Wipe off soap with dry sterile sponges. Scrub again for two minutes with 70% borated alcohol. Cover area with dry, sterile towel held in place with a straight binder and perineal straps. Clear up equipment.

Morning of operation

The patient remains in bed. The second, or preoperative specimen of urine is sent to the laboratory.

A suds enema is given in the morning as directed. Report if the result has not been satisfactory.

Liquids without milk are given until within three hours of operation.

Have a dose of morphine and atropine sulphate in the hypodermic syringe ready for administration when the call comes from the operating room.

Final steps

See Part I, Chapter XXXVII, page 245, on details of preparation.

To avoid unnecessary haste or excitement attending the transfer of the patient to the operating room, the clothing needed for dressing the patient should be ready at the bedside. The final duties in connection with the patient should be carried out by the nurse in a quiet and orderly manner, and the patient should never be hurried. To aid in getting the coöperation of the patient sometimes a few words in explanation for the reason of certain steps may not be out of place, so long as details of the actual operation are not discussed. The patient should be comfortably dressed and protected against unnecessary exposure.

A nurse always accompanies the patient to the operating room, preferably the patient's nurse. The majority of patients go to the operating room on a stretcher. The patient is enveloped in a sheet and blanket, and carefully lifted by the orderly from the bed to the stretcher. In other cases, for various reasons, it is well to transfer the patient in a wheel chair. No patient should be allowed to walk to the operating room after receiving a hypodermic injection.

LVI

SURGICAL NURSING, *continued*

For making of an Ether Bed, see Part I, page 50.

Return from operating room

The nurse precedes the stretcher with the patient and quickly turns the upper bedclothing, then the gray blanket, to the extreme foot of the bed. Every hot water bag is removed, and none replaced without an order. The stretcher is wheeled to the foot of the bed. The upper blanket is removed, the enveloping blanket is left on the patient. The nurse and orderly, one on each side of the bed, lift the patient carefully and evenly into bed by means of the folded blanket on which he has been lying while on the operating table and which serves as a stretcher throughout. The second nurse, who is detailed to special the patient, lends her assistance as needed. The blanket is slipped out and the patient placed on his side, unless the nature of the operation or injury prevents. The patient is at once covered with the blanket and the enveloping sheet is removed, when the upper bedclothing is drawn up so that he is well covered. The second pillow is tucked snugly against the shoulders and back. The upper knee should be slightly flexed to maintain a semilateral position. The dressing towel is tucked cornerwise under the patient's chin. If on an open ward the bed is screened, and a nurse detailed in all cases to care for the patient until his return to consciousness.

If vomiting on arrival, keep the patient's head turned

to one side and wipe out the mouth. Wet clothing should be removed at once and be replaced with a warm blanket without unnecessary exposure.

Immediate observations are made by the nurse on the arrival of the patient, *i.e.*, the color of the face, the respiration, quality of the pulse, temperature of the body and condition of the skin to the sense of touch, regional inspection of the binder or bandage for blood stains.

Special observations and care

Color of the face

In the early stages of recovery from ether, the patient's face is usually flushed or slightly dusky. Any change of color should be noted. Sudden blueness (cyanosis) may denote cardiac failure or lack of oxygen due to obstruction of respiratory passages. If this condition prevails, investigate at once for retained mucus or vomitus. Use the tongue forceps or wrap the wooden gag or fingers with a few layers of moistened gauze and quickly sweep out the back of the mouth, at the same time keeping the patient's face well turned to one side and the tongue pulled forward by grasping with a gauze sponge. In some cases one may hook the inside of the cheek with a finger and draw it away from the teeth, which will permit some entrance of air, especially if there should be a space left by a missing tooth.

If the teeth should become clenched, push or draw the jaw forward and downward, and introduce the mouth gag carefully to prevent injury to teeth, unless the occasion is one of emergency, then no time is to be lost. If the fingers are used to handle the gauze in wiping

the back of the mouth, they should be well protected in case the patient may unconsciously shut down his teeth upon them.

Pallor, with a pinched expression, a slowly rising pulse of feeble quality and increasing restlessness, point towards hemorrhage. Look for staining and report condition. If the pallor is from shock, the alertness and restlessness are less marked.

(For nursing care of shock and hemorrhage, see page 422.)

Respiration

The respiration is usually stertorous, especially in a stout, short-necked patient. Changes in breathing should be closely observed.

The measures referred to above under cyanosis are employed in any interference with the respiration. If, with each expiration, a bubbling or rattling sound is heard, it indicates mucus in the region of the glottis, and the back of the mouth should be swabbed out to prevent inhalation of this material into the bronchi and to keep the air passage clear.

Special care should be taken with the emergency cases which enter the hospital for immediate operation without preparation for anesthesia, the danger being that of asphyxia from food inhalation.

Failure of respiration

Paralysis of respiratory centers due to over-etherization seldom happens as a post-operative emergency. If it should happen, most active first-aid measures are carried out. Artificial respiration may be done and oxygen

may be administered. The patient's head is turned on one side, and the tongue pulled forward, using a gauze sponge. Other methods may be used to start up the reflexes. These would not be in the province of the nurse unless she be an expert anæsthetizer.

Pulse

The quality of the pulse should be noted often and its rate recorded every ten minutes until the patient returns to consciousness. If the pulse should gradually gain in rate and lose in quality, it should be reported to the one in authority.

Temperature of body and condition of skin

The skin of an ether patient is usually warm and moist. If cold and moist under cover, measures should be taken at once to increase body heat without causing sweating. Dry the skin, wrap an additional warm blanket about the patient, and apply hot water bags at official temperature of 115° F. Hot water bags are not applied at a higher temperature without a written order by the doctor. Extreme care must be exercised to protect the patient from the bags, as such patients become burned very easily, owing to dulled sensation and poor circulation. Hot saline solution or shock enema may be ordered.

Care during the period of vomiting

Vomiting usually starts as soon as the effect of ether begins to wear off, and before the patient returns to consciousness. Retching is most apparent as the stomach becomes emptied of its contents, and the patient becomes conscious. The nurse should be ready to assist the patient

as soon as vomiting is anticipated; this is recognized by the action of the accessory muscles of the neck and a gulping, swallowing action which precedes vomiting. In assisting the patient as he lies in the lateral position facing the nurse, she reaches over and places her right elbow behind the uppermost shoulder and draws it slightly forward and with her extended forearm and hand behind the patient's head, directs it forward so that the patient's face is slightly prone and completely turned to one side to promote free drainage from the mouth. With the other hand the kidney basin is placed under the lower edge of the patient's mouth to receive the vomitus. When there is no further need for the kidney basin it is placed on the stand and the patient's mouth is wiped with gauze from the lower edge upward. The mouth is also wiped out inside for retained mucus.

In abdominal cases where there are retching and straining, the region of the wound should be supported by the pressure of the nurse's hands. At this time investigate the binder frequently in the region of the wound and beneath the patient for blood stains.

Position

As a rule the patient is kept on his side until he has quite recovered from the anæsthetic, when he may be turned on his back with knees flexed and supported by a rubber cased pillow.

Return to consciousness

As the patient returns to consciousness the sensations of pain and discomfort are acute. He may become rest-

less and nauseated, and retching may be more active. If unguarded there is danger of falling out of bed. As a rule patients who are given morphine and atropine subcutaneously before taking ether make a more uneventful recovery and usually sleep off the effect of the anæsthetic. A nurse's impatience with a slowly recovering ether patient should never be manifested by shaking or calling to the patient to respond to her questions. The fact that he can mechanically tell his name is no sign of complete consciousness.

The patient should be permitted to sleep off the ether, and not be unnecessarily disturbed. Conditions unfavorable to the patient should not be discussed at the bedside, even if he is apparently unconscious or asleep. Glaring lights should be shaded or the patient be screened. As to visitors, the fewer the better; none if possible for twenty-four hours after the operation, unless on the danger list. Quiet is of importance to the patient's welfare.

Bedtime care

If the operation has been performed early in the day and the patient's condition warrants it, the usual bedtime care may be carried out with as little disturbance as possible; at least the face and hands washed. If vomiting has ceased the mouth should be swabbed out. If the patient has fully recovered from the shock of the operation, remove leggings, or laparotomy stockings, top gray blanket, and hot water bags if any. The under blanket is usually left until the following morning, as well as the rubber pillowcases.

The exposed part of the back may be bathed from

either side, and a small pillow inserted for comfort. Turn and shake the pillows. If the patient has quite recovered from the shock, a second pillow may be added to the first, and one in a rubber case may be placed under the knees for support. An opportunity should be given the patient to empty bladder. If not successful, report; otherwise measure urine and save specimen.

If nausea and vomiting have ceased, the patient may be permitted by the doctor to have sips of hot water, or hot bicarbonate of soda water (¼ teaspoonful to a glass of water); this is more gratifying in the end than cracked ice, which does not alleviate the thirst, and is productive of a dry tongue, dulled sense of taste, and gastric discomfort.

Finally examine the binder and bandage over and under the patient to detect any staining. If an amputation of arm or leg, inspect under the stump. In such cases a rubber tourniquet should be within reach at the bedside.

Note the pulse and general condition of the patient before transferring your responsibility to another nurse.

Observations

Ether patients should be carefully protected against exposure to drafts or cold.

Fowler's frame should be used to hold the bed in the desired position instead of wooden blocks, as they are of insufficient height.

Rectal saline infusions are given every 3 or 4 hours, as directed, 6–8 ounces at a time, the first as soon as the patient reaches the ward.

Nothing is given by mouth, unless ordered by the

doctor, following gastric operations, intestinal suturing, and cases of peritonitis.

Record the amount of vomitus in cases of intestinal obstruction.

Post-operative specimens of urine are sent to the laboratory on the first day.

Urine chart is kept until proper functioning of the kidneys is assured.

Four-hourly chart is kept.

During the first 48 hours morphine sulphate, grain 1/8–1/4 subcutaneous, is ordinarily given for restlessness and discomfort as well as for pain. Report to the doctor at once if the dose ordered has been insufficient.

The day following operation

If the patient has quite recovered from ether the rubber pillowcases will be no longer needed. The under blanket and half sheet and rubber protector are removed also, which leaves the patient lying on clean under bedding, and little more than tightening of the under bedclothing will be necessary.

For refreshment and in case of any odor of the anesthetic clinging to the upper sheet, it and the pillowcase next to the head should be changed, as well as the nightgown.

After an abdominal section the patient is disturbed as little as possible, except while using means to make him comfortable and giving the necessary treatments incident to his condition. In some instances a full bath may not be permitted for at least 24 hours, although other duties pertaining to the patient's comfort may be

carried out. A light toilet may be done, such as washing the face and hands and care of the mouth.

To relieve backache the back should be bathed and rubbed with an alcoholic solution every 2 or 3 hours. A small, firm pillow or rubber bag filled with cool or warm water, according to which may give greater comfort, may be placed in the hollow of the back. If permissible, a slight change may be made in the position by raising the shoulder and hip on one side with a long pillow. In many cases the patient is slightly elevated on a low headrest.

When nausea persists, a few drops of vinegar or aromatic spirits of ammonia sprinkled on a piece of clean gauze may be given the patient to inhale.

For headache, in place of an ice cap, ice cold compresses may be applied over forehead and eyes.

For the relief of gaseous distention, a small suds or M. G. and W. enema is usually ordered. Between times a rectal tube is sometimes inserted. In order to learn the results of this treatment the exposed end of the tube may be placed under water in a urinal. If the gas escapes bubbles will be formed. The success, or otherwise, of these efforts should then be recorded. Often a slight change in the patient's position in bed is said to prevent gaseous distention.

When a nurse has cared for several surgical patients who have had abdominal section performed, she should by observation have acquired a knowledge of the conditions that commonly follow, and be able to anticipate them, and apply such nursing procedures as she is permitted by the doctor as quickly as the signs of discomfort arise, before the patient makes demands. Discomfort is bound to be followed by restlessness.

LVII

SURGICAL NURSING IN SPECIAL CASES

THYROID CASES

General pre-operative care

All thyroid patients are weighed before they go to bed, and the weight recorded. Patients with hyperthyroidism must be in bed within fifteen minutes of their arrival on the ward, because of the distressing symptoms, which are aggravated by any unusual exertion or excitement, *i.e.*, nervousness, exhaustion, and rapid heart beat. Emotional strain may increase the post-operative toxic reaction, which is sometimes fatal. Every effort should be made to calm and reassure these patients, and to bring them to operations with as little disturbance as possible. To this end, it is better for them to be in a room by themselves for two or three days before operation. Moving them on the day before operation is avoided, as unusual conditions may mean a sleepless night. Non-toxic cases do not need these precautions.

Nothing suggestive of operation should be done the night before. The local preparation should be omitted. On account of increased metabolism such patients stand starvation badly. They should have their usual supper (no tea, coffee, or red meats), and in addition, a lunch of crackers and milk, or cereal, at eleven at night, if awake. A hypnotic is usually indicated. The patient is not to be disturbed in the morning. The routine of

bathing is omitted, and the room and surroundings kept quiet.

Post-operative care

Simple goitres or non-toxic cases carry only the risks of an extensive neck dissection. In hyperthyroidism the chief danger lies in the toxic reaction developing rapidly after operations, usually reaching a maximum within 36 or 48 hours. A reaction is likely to be far more marked after thyroidectomy than after ligation. It is characterized by an intensification of the symptoms of the disease, increased restlessness and nervousness, vomiting, rapid pulse, and rise in temperature. In the more severe cases the temperature reaches 104° or higher, the pulse to 160–180, or even over 200. The respirations are rapid and shallow. The restlessness may become delirium, ending in coma and death.

After care is directed towards keeping the patient comfortable and quiet, supplying plenty of fluid, and reducing temperature. Special nurses are desirable and are essential in severe cases. A 2-hour chart should be kept in toxic cases until the danger of reaction is over.

Special pre-operative orders

Simple goitres: colloid goitre, adenoma, cysts, carcinoma of the thyroid, etc.

No breakfast is given the first morning until after metabolism is done, when the patient is put on house diet. If his condition permits, he is allowed to be out of bed.

The nurse should see that male patients are shaved daily except on the day of operation. No other skin preparation is done before the patient leaves the ward.

Hyperthyroidism: exophthalmic goitre (Graves disease), toxic adenoma.

The patient remains in bed and is given a headrest, if desired, for comfort, and an ice bag is applied to the region of the heart. A 4-hour chart is kept.

The nurse takes and records daily blood pressure. If indicated, blood grouping is done.

The patient should drink at least 120 ounces, or approximately 16 glasses, of water in 24 hours.

The patient is placed on a house diet of high caloric value, with extra food between meals unless he is nauseated. No tea or coffee are allowed. Lunch of crackers and milk is given each night between 10 and 12 P.M. if he is awake.

Special attention should be paid by the nurse that the patient shall have rest and quiet on the morning of operation; no bath, no local preparation. If awake, he should drink at least two glasses of water between 6 and 7 A.M.

Pre-operative medication

Patients are digitalized before operation if this is indicated. In very toxic cases with cardiac involvement, digitalis, grains 1½, 4 times a day is given over a period of several days.

Lugol's solution, minims 5, given 3 times a day (only in cases of exophthalmic goitre), is a comparatively new development in the preparation of these

cases for operation, and as yet the rational of the procedure is not entirely understood. It causes a marked improvement in the patient's condition, as evidenced by reduction in the severity of subjective and objective symptoms, drop in pulse rate and basal metabolism. The operation is performed after the maximum improvement by Lugol's and rest is obtained.

The morning of operation, morphine, grain ¼, is administered 1½ hours before operation; and a second dose of morphine, either grain ⅙ or ⅛, with a dose of scopolamine, the dose depending on the size of the patient, or atropine, grain 1/120, when the patient is called to the operating room. The large amount of morphine administered is in preparation for the anesthesia, whether local or general.

Special post-operative orders

On return from operation the patient may be placed in any position desired for comfort unless otherwise ordered.

As a rule patients prefer a headrest, and at medium elevation. Water is urged as soon as possible without nauseating the patient, up to 120 ounces.

The urine is measured and recorded. The blood pressure is taken and recorded until the patient is able to be out of bed.

A 4-hour chart is kept until the patient is up. For soreness of the throat, hot medicated inhalations are used, and aspirin gargle is used also.

In the care of exophthalmic goitres, 6 ice bags are used and distributed thus:

2 applied to throat, one on each side
1 applied to each axilla
2 applied about the heart

Important post-operative complications

Hemorrhage. Watch for staining of dressing, steady increase in pulse rate, and a pulse of poor quality—shock.

Blood transfusions are done in severe cases of hemorrhage.

Tracheal obstruction (from edema of larynx or pressure by clots in the wound, and paralysis; recurrent laryngeal nerve). Watch for the slightest dyspnœa, cyanosis, or any embarrassment of respiration.

Tetany. Watch for numbness or stiffness of the extremities, contractures, convulsions. Tetany is due to low blood calcium. For tetany, calcium lactate, grains 15, is prescribed by mouth every 3 hours, or calcium chloride is given intravenously. In cases when the patient's hands are much contracted or a convulsion has taken place, a dose of magnesium sulphate, 25%, 10–20 c.c., is given intramuscularly by the doctor. This dose is repeated if the contracture of the hands or the convulsion recurs. The magnesium sulphate, a depressant, diminishes nerve activity and lowers intercranial pressure.

Rectal infusions are given in all cases to supply body fluids. Other medication may be ordered by the doctor when indicated. Mineral oil is given twice a day, if necessary, for the bowels.

The wound is dressed daily and the wick removed the first day. The skin clips which hold the edges of

the wound together are usually removed on the third day.

It is important that the patient should be given food as soon as possible. A diet of liquids and soft solids is given the first and second day; a high caloric diet is usually ordered. Carbohydrates are especially needed on account of greatly increased metabolism in this disease. The patient is put on a house diet without tea and coffee as soon as desired. Metabolism test and laryngoscopy for observation of the vocal cords are done before the patient is discharged.

GASTRIC CASES

Pre-operative routine

If not an emergency the patient is kept in bed to rest, and is usually observed and studied for several days before operation.

A 5-meal gastric diet is prescribed up to the night before operation. This diet is non-irritating and easily digested, consisting of liquids and soft solids, which may include the following:

gruels
malted milk
cereals
cream soups (not tomato)
unsweetened crackers
toast
rice
macaroni

No fruit drinks are allowed.

A specimen of urine and stool is sent to the laboratory for examination. Gastric cases which may indicate

ulcers, cancers, pylorospasm, etc., undergo special and careful study by the doctor.

Besides the ordinary tests examination of the blood is done, which includes:

the hemoglobin
red count
white count
blood smear, with analysis of unusual forms of cells, and differential count
Wassermann test

Blood grouping is usually done routinely in cases of bleeding ulcer or cancer. It is done also in any necessity that may arise in the course of the patient's stay in the hospital.

Pre-operative rectal infusions of normal saline solutions, or tap water, 250 c.c. (8 ounces), are given every 4 hours when fluids cannot be taken by mouth, or when not retained.

Pre-operative subcutaneous infusions of normal saline solution, or dextrose, 1000 c.c. (1 quart), are given usually twice a day in marked obstruction of the pyloric valve, when rectal infusions are not sufficient to supply the patient's fluid needs in 24 hours.

Gastric lavage may be done once or twice a day to rid the stomach of the large amount its walls secrete. It usually stops the vomiting and makes the patient more comfortable. Following the lavage, 15–20 grains of soda bicarbonate in solution may be left in the stomach.

Morphine sulphate, except in cases of bleeding, is rarely indicated pre-operatively, except in advanced cancer cases, for pain.

Atropine is prescribed sometimes to relax spasm of the pylorus, but is used chiefly in functional cases when the action of the organ is affected, and not its substance.

Post-operative care

The patient is kept flat in bed as a rule, except in some cases a low headrest is prescribed for comfort 24 hours after operation.

Morphine sulphate, grain $\frac{1}{6}$–$\frac{1}{4}$, may be ordered given every 2 hours as needed, for pain and discomfort. Tap water, 6–8 ounces, is given by rectum at 108° F. every 4–6 hours.

Subcutaneous infusions of saline solution, 500–1000 c.c. (16 ounces–32 ounces), are given on return from operating room.

Post-operative diet

Day of operation. Water, 1 ounce every hour, beginning 8 hours after operation, if the patient is not vomiting.

First day. Strained cereal gruel or malted milk, 2 ounces every 2 hours, alternating at hourly intervals with water, 2 ounces.

Second day. Cereal gruel or malted milk, 3 ounces every 2 hours, alternating with water, 3 ounces every 2 hours.

Third day. Cereal gruel, malted or boiled milk and water, half and half, 4 ounces every 2 hours, and water besides.

Fourth day. Cereal gruel, malted or boiled milk with

crackers or toast, 6 ounces every 3 hours, and 1 coddled egg in addition.

Fifth day. To previous day's diet add cream soups and soft cereals.

Sixth day. Add bread and butter and baked potato.

Seventh day. Same as sixth.

Eighth day. Five-meal gastric diet with care.

If the patient vomits, stop all food and give only sips of water, and start again on first day diet.

Discharge with 5-meal diet, as follows:

Three small meals of simple foods, not highly seasoned; no acids, no condiments, no fried food. Red meats are allowed once a day, chicken, fish, or eggs once a day in addition. Vegetables, only those that can be made into a purée. Between meals, *i.e.*, at 10 A.M. and 2 P.M., cereals, malted milk, milk with crackers or bread, egg-nog, making 5 meals in all.

INTESTINAL OBSTRUCTION, PARTIAL OR COMPLETE

Pre-operative treatment

Liquids without milk are given to the patient, if not vomiting. If enemata are ordered, note and record gas and fecal results. No catharsis unless prescribed. Rectal infusions of plain water are given as ordered, a pint at 108° F., unless too painful for the patient to bear; under such conditions the infusions should be given very slowly, to lessen liability to pain and for better retention.

Post-operative rules

No rectal infusions unless ordered. Such cases should never get rectal fluids.

ACUTE GENERAL PERITONITIS

Post-operative care

Fowler's position to be maintained. Sufficient morphine is prescribed to keep the patient comfortable. Nothing is given by mouth, but the patient's mouth may be swabbed for comfort every 2 or 3 hours, and cold cream applied to his lips.

Tap water or dextrose, 5% solution, is given by rectum.

If the patient is vomiting, saline solutions are given subpectorally as ordered.

If vomiting persists, lavage of the stomach is done.

No catharsis or enema is to be administered.

A rectal tube is used if necessary for relief of flatus, and the results are noted.

VAGINAL PREPARATION

The night before operation a gallon douche of corrosive sublimate, 1–8000, is given.

PERINEORRHAPHY OR SUTURATION OF THE PERINEUM

Post-operative routine

Patients should void or be catheterized 12 hours after operation.

Before resorting to the catheter all means should be used to encourage emptying the bladder, as already directed in Part I, page 178, urinary retention.

After urination or defecation the vulva is to be douched with warm 2% boric solution, and the stitches and parts sponged with dry sterile sponges. In douching, a glass or rubber urinary catheter should be used in place of the ordinary douche nozzle. Catharsis and suds enema are given the third day after operation.

The patient should be told not to strain, to avoid tearing the perineal sutures.

Sterile gauze and vulva pad, held in place with firm T-binder, should be worn constantly until the removal of the perineal stitches. Gauze packing in the vagina is to be removed in 24 hours, except when put in for drainage.

RECTAL AND COLON CASES

Including hemorrhoids, fissure and fistula of the anus, and polypus.

Pre-operative treatment

The day before operation castor oil, 1 ounce, or magnesium sulphate saturated solution, 1½ ounces, should be given if possible before 4 P.M. Suds enema is given the morning of operation.

Post-operative care

Sterile gauze and pad should be kept against the rectum, held in place with a T-binder. Liquids are given without milk for 4 days. Deodorized tincture of opium, minims 10, may be prescribed 3 times a day to arrest peristalsis and avoid bowel movements.

Fourth day. The patient is given a dropped egg on toast at 6.30 P.M. An oil enema, 6 ounces, is given at 8 o'clock, to be retained.

Fifth day. At 6 A.M., magnesium sulphate solution, 1½ ounces, is given; at 8 o'clock, a suds enema. Diet, soft solid.

Sixth day and subsequently. House diet is taken when the patient is ready to be discharged. A prescription for mineral oil is given, 1 ounce to be taken twice a day, as ordered.

LVIII

SHOCK AND HEMORRHAGE

Shock or collapse may be mental, physical, or both.

Mental shock is associated with violent emotional disturbances, the profoundness of which is sometimes governed by the mental stability of the person. Some of the causes may be fright, such as a narrow escape from an accident; sudden bad news; sights of a distressing nature; or sudden loud, explosive sounds (shell shock).

Physical shock is a sudden arrest of the bodily functions causing vital depression and prostration, due to vaso-motor dilatation, which may result in death. It may follow extensive operations, when it is known as surgical shock. It may be produced by accidental injuries, with or without a loss of blood. Shock following extensive burns of the body may be aggravated by the pain on the sensory nerve endings in the skin, since all forms of pain increase shock.

Signs of shock

The pulse is weak, rapid, irregular and compressible.

The respiration is shallow and thoracic.

The temperature is subnormal.

The skin is cold and clammy.

The face is pale or dusky, with dull, apathetic expression, nostrils pinched, eyelids drooping, eyes rolled up.

There may be vomiting, and in general there is extreme prostration.

Signs of shock with hemorrhage

When shock is complicated by internal hemorrhage the pulse gradually increases in rate. The blood pressure falls in proportion to the amount of blood lost.

There is hunger for air, with gasping and exhaustion.

The temperature is subnormal, the skin cold and clammy, with cold extremities.

The expression is anxious, sometimes alert. As the condition grows more serious the pupils of the eyes are dilated.

There is thirst and restlessness, pushing off the bedclothing.

In case of an external or visible hemorrhage, pressure is immediately applied.

If an extremity is affected, a tourniquet is used. (See page 131.)

In bleeding below the wrist make pressure at the wrist; in the arm, pressure above the elbow; in the leg, follow the same order, and the part elevated on pillows.

General nursing care

The nurse should move quickly but quietly, assuming an air of assurance, and not that of anxiety, while in the presence of the patient.

The nursing care and prescribed treatment are directed towards the conservation of body heat, the starting up of vaso-motor activities, and relief of pain if present.

External treatment

Removal of damp clothing without exposure.

Warm blanket next to skin.

Surround with protected hot water bags at 115° F., one in the region of heart. Avoid sweating the patient.

Remove pillows. Place one upright against head of bed.

Elevate foot of bed.

Extremities may be bandaged to lessen the circulation circuit and thereby increase blood supply to vital organs.

Indirect circulation of fresh air.

Quiet. Morphine is usually ordered in cases of hemorrhage to allay anxiety and stop restlessness.

Internal treatment

100 c.c. of 15% saline infusion to raise blood pressure.

Blood transfusion may be indicated.

Prescribed treatment

If shock following operation is not due to hemorrhage, more active stimulation is prescribed and all possible avenues are employed for treatment.

By rectum, shock enema

black coffee, 2 ounces
brandy, 2 ounces
salt solution, 2 ounces
temperature, 110° F.

To be given to patient, without regard to position, under blankets and with as little disturbance as possible. In some cases the brandy is omitted and the salt solution increased to make up a total of 6 ounces.

Tap water or saline solution may be prescribed, usually 1 pint, at 110° F., every 3 or 4 hours.

By hypodermoclysis, or intravenously

Saline solutions are used, sometimes combined with adrenalin chloride, when given intravenously.

Subcutaneously

Caffein sodium salicylate, grains 3–4.

Camphorated oil, 20%, 15 minims, intramuscularly, as a rule into the glutei muscle.

By mouth

Sips of hot water, black coffee or tea, or teaspoon doses of aromatic spirits of ammonia, 1 dram to a half-glass of hot water.

By inhalation

Smelling salts.

For failing respirations, oxygen.

In extreme cases, artificial respiration.

Delayed shock

Shock, which may appear an hour or two following an operation, especially that of laparotomy, or in a case of suspected internal injuries, is of serious importance and is indicative of hemorrhage. If suspected, report at once and carry out the same preliminaries as those in the external treatment of shock. In addition, an ice cap may be applied to the abdominal surface.

All internal stimulation previously prescribed should be withheld until further advice, and nothing given by mouth. For the comfort of the patient, his lips could be kept moist with water or a single layer of wet gauze placed over his mouth, or his mouth washed out.

If a case of amputation or of abdominal surgery, sterile materials for a dressing should be in readiness for the doctor.

Blood transfusion is done as a rule when bleeding has stopped, or as a supportive measure before an operation.

LXIX

HYPODERMOCLYSIS

This operation is the quick introduction of fluids through the skin into the connective tissue by means of large, hollow needles. The subpectoral region is preferable because of more space.

Purpose

For the infusion of salines in surgical shock and hemorrhage.

To supplement the fluid intake by the patient when insufficient.

To dilute the blood before and after operation as a measure against acidosis, in conditions of abdominal sepsis, and in the toxemia of uremia.

Equipment

shoulder blanket
tray set with
  2 sterile towels
  2 packages of sterile gauze
  adhesive plaster
  tincture iodine, 3½%
  novocaine, 1%
  2 c.c. syringe

The remainder of the sterile supplies are brought to the ward from the operating room by the doctor, and consist of: a flask of sterile solution, 100° F., 2 as-

pirating needles, a 2-liter irrigating can fully equipped with 4 feet of rubber tubing attached to glass Y-shaped tube. To each branch of the Y is another extension of tubing about 18 inches long for the attachment of the aspirating needles later.

Region of injection

Usually in the body where the folds of the skin may be readily picked up with the fingers when inserting the needle; as a rule, the site under the subpectoral muscle, in anterior axillary line. It is important to put the needle under the muscle and not into it. Sometimes into the thigh and into the peritoneal cavity in the case of children.

Procedures

While the doctor scrubs his hands the nurse prepares the patient by folding the bedclothing and nightgown out of the way. If a subpectoral infusion, the nightgown is removed and the patient protected with a shoulder blanket, over which is placed a sterile towel; both are tucked back out of the way when the doctor is ready for the operation. The flask of solution is emptied into the sterile irrigating can, which is suspended at the head of the bed, about 3 feet above the mattress. The tube is tested, air expelled, and the tubing clamped. The aspirating needles are then attached.

The doctor does the local disinfection of the skin with iodine, which is applied with a sterile sponge over the site of the proposed injection, and then injects

the novocaine. Sometimes a prescribed amount of novocaine is placed in the saline solution, so that the patient is not submitted to unnecessary pain from repeated introductions of needle. If the patient is still under the effect of an anesthetic or otherwise unconscious to pain, the intradermal novocaine would be omitted.

When ready to give the infusion, a little of the solution is run through the needles, then the muscle at the site of operation is firmly grasped, and the aspirating needle is forcibly thrust through the skin into the connective tissue. If a subpectoral infusion, one needle is used on each side, and the solution allowed to flow quite rapidly. The nurse must watch the solution within the can, and notify the doctor when the solution approaches the prescribed line of the graduated scale, so that the tubing may be clamped to avoid the danger of air in the tissues. The amount given to adults is usually 1000 c.c. (32 ounces); for infants and children, 250–500 c.c. (8–16 ounces). If there is much bulging of the skin, owing to slow absorption on one side more than the other, the rubber extension of the Y tube is clamped off and a pause is made. The infusion is resumed as soon as absorption takes place. In some cases it may be necessary to manipulate the swelling gently with the hand from the point of injection to the periphery, or change the position of the needle.

On completion of the operation, as each needle is withdrawn, a sterile sponge is applied over the point of puncture and held in place with two adhesive strips.

To relieve the painful tenseness following infusions, applications of moist heat may be used. Often 25–30 c.c.

novocaine, 1%, is added to the solution to diminish the pain due to distention.

Following the operation, the amount and nature of solution used should be noted, also the patient's pulse and general condition.

Infusions are given also directly from the sterile flask as it is taken from the thermostat. There may be less danger of infection than from the pouring of the solution from one utensil into the other, even if both utensils are sterile, because of contact with the air while pouring. The progress of the solution as it runs out can be better observed also.

LX

INTRAVENOUS INFUSION

An intravenous infusion is the administration into a vein of a sterile solution, usually an isotonic or 6% saline solution, given primarily for its bulk of fluid.

Purpose

To stimulate circulation in cases of surgical shock.

For its temporary effect until compatible blood can be obtained in cases of severe hemorrhage, when the loss is so great that a transfusion is indicated.

To aid in the dilution and elimination of toxins in septicemia, uremia, or eclampsia. In eclampsia the infusion is frequently preceded by bleeding (see Venesection, page 388).

In cases of dehydration from high fever or prolonged vomiting and diarrhea, particularly if attended by acidosis, the body fluids may be replaced by an infusion of dextrose, 5% to 10% in salt solution, because it furnishes a readily assimilable amount of fluid especially of value in combating acidosis and for its caloric value. The glucose solution on heating, as autoclaving, breaks down to a certain extent and produces acid. It breaks down also, but less rapidly, in a warm room. The buffer solution is a mixture of mono- and di-sodium phosphates of the same degree of alkalinity as the blood. It can take up a large amount of acid without becoming more than a very little more acid. 10 c.c. of the buffer is

added to 2 liters or 1000 c.c. of the glucose just before use, to take up the acid that has formed and make the whole solution the same alkalinity as the blood. It should not be added until the glucose is about to be used, as the glucose does not keep so well. For intravenous or subcutaneous injection only chemically pure dextrose should be used.

Methods

Infusions may be done by two methods: first, by gravitation; second, by injection, using the three-way stopcock and syringe.

First method

Equipment

sterile half sheet
2 sterile towels
2 packages of sterile gauze sponges
bowl of soap solution } for preparation
bowl of 70% alcohol } of the arm
500 c.c. flask of sterile saline solution, 112°–115° F.
sterile 2-liter irrigating can with sterile rubber tubing about 3 feet long and long glass connecting tube
test tubes with sterile intravenous needles
2 c.c. syringe with novocaine
scalpel and small forceps, should the vein be too small for needles
adhesive tape
flexible collodion and applicator
empty sterile flask for a mixer if solution should be too hot

Procedure

With the patient's arm supinated (palm upward), the bend of the elbow and surrounding parts are cleansed and wrapped in a sterile towel. The table is prepared and brought close to the bedside.

The irrigating can and tubing are released from their sterile coverings and suspended 2 feet or more above the mattress. The saline solution is poured from the flask into the irrigating can. The patient's arm is extended on the table above the sterile sheet and towel, and the tourniquet applied in the usual way, with light pressure.

The intravenous needle is attached, the clamp on the tubing released, and a little of the saline solution is allowed to run out of the needle, when it is introduced into the median basilic or median cephalic vein, with little apparent discomfort to the patient, *i.e.*, if the needle is sharp. When the needle is in position the tourniquet is removed. The solution should be given no faster than it can be absorbed, and the flow may be regulated by changing the elevation of the can.

The amount of solution administered is indicated by the falling fluid level, and the scale inside of the irrigating can. This observation is important, because if the level of the solution should fall below the end of the tube it would result in the introduction of air into the vein, which may cause air embolism. The glass tube, also, is watched for air bubbles. When the desired amount of solution is introduced, usually about 500 c.c., the tubing is clamped and the needle quickly withdrawn. Quick pressure is made over the puncture

with a sponge, which is held in place with adhesive tape, or small punctures are covered with flexible collodion.

Second method

Equipment

In place of the elevated irrigating can and tubing, the second method calls for slow injection of the saline solution into the vein by the use of a syringe, three-way stopcock, and intravenous needle. The remainder of the equipment is the same as that used in the first method.

Procedure

The 500 c.c flask of sterile saline solution is placed on the sterile table, and the three leads from the stopcock are joined by rubber tube connections with the long glass connecting tube in the flask, the 30 c.c. syringe, and intravenous needle, respectively.

The tubing to the syringe is usually shorter than that to the needle and flask. By means of the three-way stopcock, communication may be established first between the syringe and flask, and then between the syringe and intravenous needle. Thus the infusion is given by filling the syringe from the flask, and then, after turning the stopcock, the syringe is slowly emptied into the vein. When the syringe is empty, communication with the flask is reëstablished by turning the stopcock back to its original position and the syringe may be refilled. A record is kept of the amount introduced, and the procedure is continued until the desired amount is given to the patient.

For either gravitation or syringe method the tubing must be filled with fluid before entering the vein, to avoid the dangers of air embolism. All apparatus used in this operation should be sterile.

The puncture wound is covered in the usual way with adhesive tape and the patient made comfortable.

LXI

TRANSFUSION OF BLOOD

Transfusion is an operation for the purpose of transferring blood from the circulation of one person to that of another in order to restore a depletion of the blood supply following a pathological or traumatic hemorrhage, or to help in the regeneration of the red blood corpuscles. Transfusion is done in such cases as hemophilia, purpura hemorrhagica, primary anemia, bleeding gastric ulcers, hemoptysis, hemorrhage of the new born. It is done also in cases of poisoning, as from benzol or carbon monoxide. In surgery, preoperative transfusions are done in cases of severe jaundice when the coagulation time of the blood is slow, and to prevent shock in traumatic amputation or severe injuries and burns; post-operative transfusions are done in shock and hemorrhage.

Methods

The direct method. The artery of the donor is connected with the vein of the patient by a small cannula. This method is rarely used now.

The indirect method. The blood is removed from the vein of the donor, not in immediate connection, and transferred to the vein of the recipient.

Blood grouping

In some hospitals a list of suitable donors is kept on file, who, for remuneration, are willing to act as sub-

jects for transfusion. Each donor must be indirectly grouped, have a negative Wassermann reaction, a negative venereal history, and be free from malaria. In case of any recent infection, he undergoes an examination before transfusion. The recipient's serum is then directly grouped with the donor's corpuscles to avoid agglutination or clumping following transfusion. "If both tests are negative, it indicates that the two individuals belong to compatible groups and that their blood is suitable for transfusion."[1] If not an emergency case, a light diet is given the day of operation. The patient's red count and hemoglobin are taken.

Whole blood transfusion

Equipment

cocaine, ½%, or novocaine, 1%
2 c.c. syringe and needle
sodium citrate, 2%
warm saline solution, 6%, to put in veins
cold saline solution, to rinse syringes
7 glass 30 c.c. syringes
3 transfusion needles with pistons (Vincent)
short lengths of rubber tubing to fit syringes and transfusion needles
pair scissors
4 towel clips
sterile tourniquet
sphygmomanometer
4 half sheets
package (5) sterile towels

[1] "Transfusion of Blood," by George R. Minot, M.D., and Roger I. Lee, M.D.

3 gowns
package sterile sponges
2 round basins
square basin
iodine
alcohol

Procedure

In addition to the doctor and his assistant there should be a sterile nurse and an unsterile nurse or orderly, to wait upon the others.

The donor and the patient are placed on trucks, reassured by the nurse, made comfortable and kept quiet. The nurse's table stands between the trucks at the head. A sphygmomanometer is adjusted to the donor's arm. The doctor then swabs the donor's arm with full strength iodine well above and below the elbow. The arm and hand are draped with sterile towels and 2 sterile half sheets are draped over the donor. The patient is treated in the same manner, except that a sterile tourniquet is used instead of a sphygmomanometer.

The doctor proceeds to anesthetize the skin of patient and donor with novocaine or cocaine. The unsterile nurse now pumps the sphygmomanometer up to the donor's diastolic pressure, and maintains it at that point so that the arterial flow is not interfered with until the necessary amount of blood has been taken. The doctor and his assistant, simultaneously if possible, each inserts a needle in the vein of the donor and the recipient.

The doctor hands the filled syringe to his assistant, who, having inserted a needle in the patient's vein, has

removed the tourniquet, and is ready to inject the donor's blood into the recipient's vein.

The nurse hands the doctor a clean syringe, takes the used syringe, rinses it in cold salt solution, then in sodium citrate. It now is ready for use again. (The nurse must always have ready a syringe filled with warm salt solution to be injected into the patient's or donor's vein if there is any delay, such as occurs when the needles become plugged or come out of the vein.)

This procedure is carried out until 300–600 c.c. or more of blood have been given, depending on the age and the needs of the patient and the condition of the donor. The needle is withdrawn.

The iodine is then washed off with alcohol and a drop of collodion dropped on the needle wound.

The donor is frequently given a stimulant, and is advised to force fluids and to rest for a few hours.

The patient is returned to bed (ether bed preferably) and kept warm with blankets and given warm drinks. The necessary observations are made to detect any reaction, which should be treated symptomatically. A two hourly temperature is taken and recorded for twelve hours following transfusion, and any sign of chilliness and rise in temperature is to be reported to the doctor at once.

Paraffin tube transfusion

Equipment

3 Vincent tubes freshly paraffined, sterilized
3 surgical gowns
4 half sheets
4 towels

package sponges
sphygmomanometer
round basin for warm saline
square basin for sodium citrate to cleanse needles
2 blunt transfusion needles } with rubber connecting
4 sharp transfusion needles } tube
2 30 c.c. syringes, to put warm saline into the vein
2 Davidson bulbs
tourniquet
4 Elsberg hooks
6 mosquito snaps
2 pairs small scissors
2 pairs small forceps
4 towel clips
knife
tube, No. 0, plain catgut
small glass for novocaine
2 2 c.c. syringes with needles
4 Glover needles with No. 5 black silk
warm saline and citrate
novocaine, 1%
iodine

Procedure

The patient and donor are placed on trucks which are so arranged that sufficient space is left between for the operators. The sphygmomanometer is placed on the donor's arm, and iodine preparation is used on the arms of patient and donor, and both are draped with sterile towels. The novocaine is next injected, from 2 to 4 c.c. being the amount usually employed.

The vein is exposed by a small incision, and a double ligature of No. 0 plain catgut passed around it, the proximal ligature being tied in the donor, the distal in the recipient. The ligature which is not tied is used as a loop, traction on which serves to close the vein when the tube is not in place. The surgeon then picks up the vein and makes a cut in its wall with his small scissors. The Elsberg hooks are used to hold the walls of the vein apart if necessary, the Vincent tube is put into the vein of the donor, and the sphygmomanometer is pumped up to between 60 and 90.

In the meantime the sterile tourniquet has been applied to the patient's arm and the same procedure of cutting down on the vein carried out. The tube, when filled, is transferred to the patient, and the nurse then attaches the outflow end of the Davidson bulb onto the tube and pumps the blood into the vein. In cases where the vein is too small for the end of the tube, a blunt, hollow transfusion needle is used and the Vincent tube is placed in the end of it.

Note

In cases where there is a delay in getting the blood from the donor, warm saline solution is sometimes injected into the patient's arm while waiting.

Each Vincent tube holds about 250 c.c., and the amount of blood used varies according to conditions of patient and donor. The usual amount for an adult is from 2 to 3 tubes.

Black silk is used to sew up the incision, and a sterile dressing is applied.

When the operation is completed, the patient is put to bed between blankets. Note pulse and respiration. Watch for chills, rise in temperature, nausea, vomiting, and restlessness. A patient may have a chill following transfusion which may be due to slight incompatibility of the blood, and is not considered serious under these conditions, but it should be reported. In the meantime hot water bags and blankets should be applied.

TRANSFUSION OF INFANTS AND CHILDREN

Purpose

To replace blood lost, as in traumatic or post-operative conditions.

To stimulate bone marrow activity, as in the various forms of anemia or purpura.

To combat sepsis by increasing the antibodies of the blood, as in sinus thrombosis.

Indication for

Hemorrhage of the new born. Transfusion is of specific therapeutic value. Usually small quantities of blood (20–30 c.c.) are used at frequent intervals.

Secondary anemias.

Due to sepsis, *e.g.*, septic umbilicus most common.

Due to marasmic condition, usually found in children kept too long on a milk diet.

Hemophilia. Indicated only where there has been great loss of blood.

Purpura. A two-fold indication in this condition, as it not only replaces blood lost, but also increases the

number of blood platelets and thus increases the coagulation time of the blood.

Primary anemias. A rare condition in childhood, in which transfusion is the only therapeutic measure.

Acute hemorrhage, due to any cause, *i.e.*, trauma, postoperative, etc.

Methods

Intravenous

Paraffin Method. A tube that has been paraffined in the inside is used. Blood is drawn from donor and injected into recipient as quickly as possible. This method requires at least one assistant.

Citrate Method. Blood is drawn in a syringe containing a citrate solution which prevents clotting. This method does not require the aid of an assistant.

Intramuscular. Used most frequently in small infants, as for hemorrhage of the new born.

Intraperitoneal. Used in older infants. Advantages: Less painful to the child and greater quantities may be given. Objections: Danger of abdominal adhesions due to the fibrin of the blood; danger of infection of the peritoneal cavity; danger of peritonitis from perforation of a viscus.

Technic

For *intravenous injection,* the technic is the same as for adults, namely, the donor's blood is first grouped with a stock serum (indirect grouping) to determine to which one of the four groups he belongs. If the

donor is found to belong to the same group as the recipient, the donor's blood is grouped with the patient's serum (direct grouping) to determine the compatibility of the donor's red blood cells with the patient's serum. Most frequently the jugular vein is selected.

In children below one year blood grouping is not necessary. Either parent can be donor for intravenous injection.

For *intramuscular* or *intraperitoneal* injection, any human blood may be used. The most frequent site for intramuscular injection is the gluteal region.

Anaphylaxic phenomena in children are very rare. Symptoms are the same as in adults, *i.e.,* labored respiration, clammy skin, dilatation of pupils, etc. Treatment is also the same as that for adults, namely, hot water bottles and blankets.

LXII

RECTAL SEEPAGE (PROTOCLYSIS)

Rectal seepage is commonly known as the "Murphy Drip," after the originator, the late Dr. John Benjamin Murphy of Chicago, although it is administered in various ways, not always in strict accordance with his methods.

This treatment is the slow percolation of fluid into the rectum for retention and absorption by the body tissues. Its chief use is when the patient cannot retain rectal taps, in such cases as sepsis of the peritoneal cavity. The seepage lessens the absorption of toxines by filling the tissues with water; increases elimination when the fluid intake is insufficient; dilutes the blood in such conditions as diabetic or uremic coma; allays thirst when nothing may be taken by mouth; and is a simple means of forcing fluids without disturbing the patient.

Solutions

For increase of body fluids, plain tap water or 0.6% saline solution is used.

In cases of acidosis, diabetic coma, or for sustenance, 5% to 10% glucose in a 0.6% saline solution.

If sodium bicarbonate is prescribed, drams 2–3 are given to a pint of saline solution.

Equipment

hopper towel
half sheet and rubber
enameled basin
enameled pitcher
pint graduate
bath thermometer
lubricant
thermos bottle and tubing
solution as prescribed

Method

The rate of drop per minute is usually prescribed according to pressure and amount of solution to be absorbed in a given time. The rate is generally 50 to 60 drops a minute, or between 2 and 3 gallons in 24 hours. When the bowels are distended, the fluids should be dropped more rapidly to counteract back pressure.

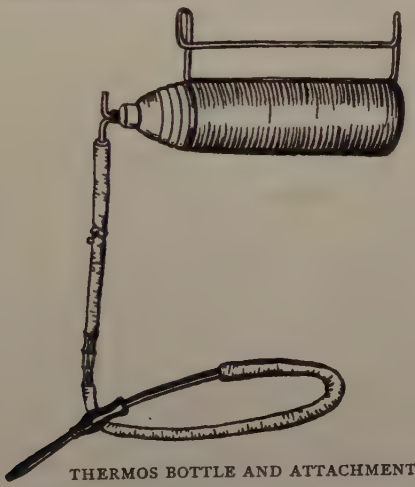
If retained, this treatment may be continuous over 3 or 4 days; on the other hand, if the rectum becomes irritated and leakage around the tube is evident, the patient is placed on intermittent seepage, in periods of 2 to 4 hours. The left-over fluid is always measured and deducted from the total amount, in order to record how much the patient has absorbed.

If patients are not allowed fluids by mouth, the lips should be thoroughly covered with cold cream and the mouth frequently swabbed.

In the case of a child, the arms should be kept outside of the bedclothing by arranging it snugly under the arms, and securing the edges of the sheet to the head of the bed with tape or bandage.

Thermos bottle seepage

Because of its heat retaining qualities, a quart thermos bottle serves as a substitute in the absence of regular apparatus. In place of the cork a large soft rubber stopper is used, perforated by 2 ¼-inch metal tubes.



THERMOS BOTTLE AND ATTACHMENT

These are bent at right angles, one up and the other down just outside of the cork. One serves as an air valve; the other, which is longer, dips into the solution within the bottle and acts as the supply tube. Its outside end is connected with the central tube of three rubber tubings about 5 feet long, one fitting within the other to aid in keeping the solution warm in its slow passage from the bottle to the patient. The tubing is interrupted 9 inches from its attachment by a cylindrical window, which encloses a set of graduated glass droppers, through which the drip can be

seen. It is regulated by a screw clamp attached to the tubing above.

A No. 22 French rectal catheter is connected with the central tubing by a small glass connecting tube. Eight inches from the tip of the catheter is a hard rubber self-retaining rectal tube, with an olive-shaped bulb, which fits between the internal and external sphincter ani.

Preparation

Owing to the slow dropping of the solution and the length of the tubing, the temperature should be 125° F., which will be not much more than 100° F. by the time it reaches the rectum. The thermos bottle is rinsed with hot water, and 28 ounces of the hot solution is poured in, which will permit sufficient air space in the bottle. The rubber stopper is inserted with the metal air valve upward, to prevent leakage. If there is any danger of the stopper becoming loose, secure it with a strip of adhesive tape over its top and extending down over the neck of the bottle. The thermos bottle and holder are hung in a horizontal position at the head of the bed. If the patient is in the dorsal position the bottle need not be elevated more than 12 or 18 inches above the mattress. If the patient is in Fowler's position, the bottle is suspended about 2 or 3 feet above the mattress, because greater pressure is required to aid retention and absorption of the solution.

In any case the receptacle should be high enough to promote sufficient pressure for absorption of the amount prescribed. Too great elevation may cause a flow too rapid for absorption and leakage may follow.

Regulation of seepage

A basin is placed on the floor. The clamp of the tubing is loosened and a little of the solution is run into the basin to warm the tubing and expel the air. This solution is measured later. By tightening the clamp the drip is controlled, the desired rate being obtained by observing the drops through the glass window and regulating them by the watch.

The introduction of the rectal catheter

The rectal bulb and catheter are lubricated and carried under the patient's thigh on the side nearest the thermos bottle. The catheter, including the rectal bulb, is carefully inserted into the rectum until the rim of the bulb fits snugly outside of the anal sphincter. Pressure should be made with the towel against the rectum for a minute or two until the patient gets accustomed to the sense of obstruction and the desire to force out catheter has subsided. In some cases it may be necessary to secure the outside extremity of the catheter to the back of the patient's thigh with adhesive tape.

Hindrances to retention of seepage

The presence of feces or flatus in the rectum, for which a small enema may be given.

The doubling of the catheter in the rectum if too small in caliber.

Too rapid rate of drip, and leakage, regulated by lowering thermos bottle.

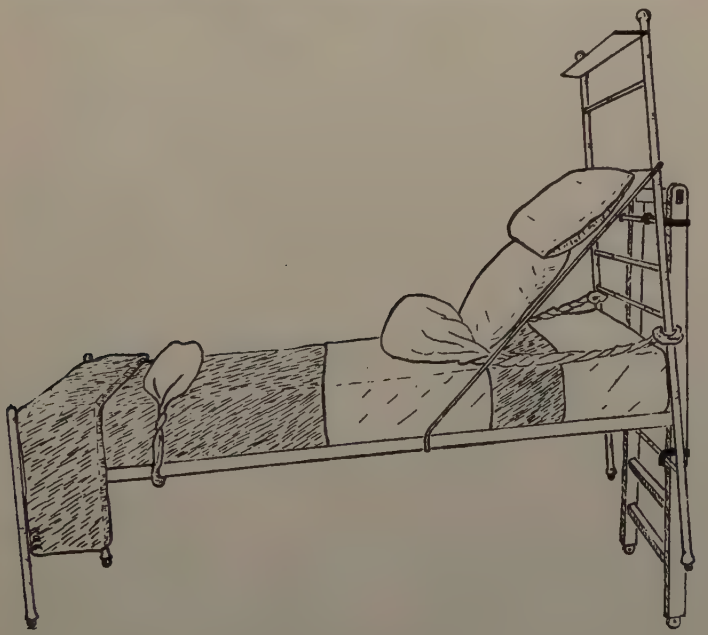
After care of thermos bottle and tubing

The bottle is washed inside and out with soapsuds, then rinsed in clear water and dried. The tubing and glass connecting tube are thoroughly drained. The tubing is washed off with hot suds. The catheter and rectal bulb are washed in cold water and hot suds. They are then soaked for a few minutes in hot 2% sylpho-nathol solution, as boiling may damage the hard rubber bulb, which must not be removed from the catheter for any purpose, since it is most difficult to replace. When the thermos bottle and apparatus are clean and dry, they are returned to the pharmacy ready for use.

LXIII

FOWLER'S POSITION

Fowler's position, named after the late Dr. George Ryerson Fowler of Chicago, the originator, is that of elevation of the patient's head 18 or 20 inches higher than his feet, bringing him into a sitting position. The purpose of the position is to facilitate gravitation of pus to the pelvis, on the theory that it may form a localized abscess there, where absorption of toxic mate-



BED ON FOWLER FRAME

rials is less than in the upper abdomen, owing to the distribution of the lymphatics; the nearer the diaphragm, the more rapid the absorption.

The bed is prepared before the arrival of the patient, and made as an ether bed. The head of the bed is elevated on an adjustable wooden frame, supported by iron notches, or wooden blocks, or a wooden armchair may serve as a substitute. If the head of the bed is not adjustable a headrest is used, and in order to prevent the patient from slipping down, a pillow roll and sheet are placed under his knees to hold the flexed position. For additional comfort and support, a sheet is folded lengthwise to the width of 12 inches or more and stretched tightly across the mattress and tied on each side of the bed. A small woolen blanket is next folded and made into a tight roll and inserted within the folds of the sheet, which serves as a brace for the patient's feet. A shoulder blanket is applied for protection and comfort.

LXIV

SURGICAL DRESSINGS

A surgical dressing is designed for use in active surgery in caring for the patient's wounds following operation, and for accidental injuries. The material in common use is a loosely woven cotton fabric called surgical gauze, which is purchased in bolts and from which many of the surgical supplies are made.

Small gauze sponges are most commonly used in the operating room and wards. They are made with the gauze cutter by cutting a bolt of gauze into yard squares of two thicknesses. These are recut into pieces 18 by 12 inches; thus 6 sponges are obtained from each yard. The sponges are made by turning in the rough edges, then each corner. About 2½ inches is folded over on each side and these folds brought together, then end to end in the same fashion. When completed, the sponge should be 4 by 2½ inches.

When gauze is made into surgical sponges they are carefully counted, neatly stacked, then enveloped and secured in unbleached cotton covers or packed without coverings in metal drums, ready for sterilization. To be sterilized, they are placed in a double jacketed copper autoclave, or sterilizer, and are exposed to steam heat at 15 pounds pressure, which equals about 250° F., for forty minutes on each of two consecutive days. This is called fractional sterilization, and this method is used for the destruction of bacteria and the more highly resistant spores.

Besides the surgical sponges, dressings may consist of gauze pads and large gauze handkerchiefs, a yard square, with their raw edges folded in, put up in packages to be used in abdominal surgery to protect and wall off the field of operation.

Other materials, such as absorbent cotton, sheet wadding, and picked cotton, are made into pads and are used to reinforce dressings.

Sterile gauze and pads are applied for protection from outside contact and air, for pressure, and for absorption of serum or pus in open or discharging wounds. A light packing or drains are introduced into the wound when it is necessary to keep the edges apart, or to facilitate drainage. At the time of operation cigarette drains are sometimes used, made by surrounding a narrow gauze sponge with a covering of thin rubber tissue or tubing. In ward dressings the rubber tissue may be used alone, or a bias strip of gauze cut from the corner of a sterile sponge, freed from its thread ravellings, and the raw edges folded into a smooth point.

Chemical agents may be combined with a surgical dressing and applied locally for stimulation to a slowly healing wound or for disinfection.

Methods of holding dressings in place are governed by the location of the wound. Dressings of the thorax are held by adhesive strips and cotton binders, as are those of the abdomen also, except the scultetus binder, which is used more commonly than the straight binder in cases of obese adults, as it affords better support. These binders are held down on each side by a perineal strap. Dressings of the head and extremities are held

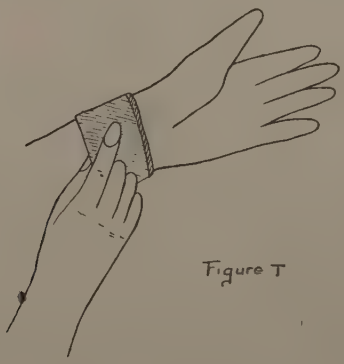
in place with cotton rollers and bandages; those between the thighs, with T-binders.

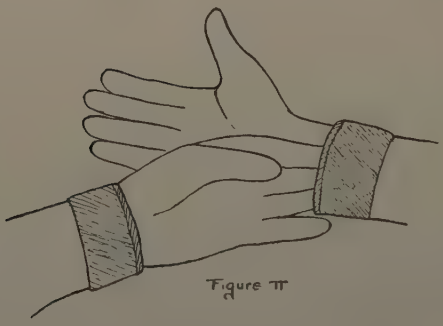
Procedure in doing an abdominal dressing without assistance

Turn down the upper bedclothing to the crest of the pubes; place the patient's arms comfortably out of the way; turn the nightgown up as far as the sternum, supporting the elbows within the folded nightgown, which is tucked out of the way under the edges of the lower pillow. Unpin binder; remove perineal straps; roll the nearer side of the binder close to the patient's side. Have a basin or bag ready to receive soiled dressings. Remove outside pad and dressing, or if a discharging wound, remove later with forceps. Place a dressing towel over the folded nightgown and tuck the edges of the towel under it, leaving an unobstructed field. Lay the sterile towel containing the instruments on the patient below the pubes. Open the towel, which will expose the instruments to view. Turn out from their coverings several packages of gauze sponges and a pad, if needed, upon the sterile towel. Cover the instruments and dressings with half of the towel, not forgetting to turn back its selvage edge slightly to permit the later introduction of the nurse's clean hand between the folds. Loosen the towel about the sterile rubber gloves on the tray.

The usual scrub up is now done as for other aseptic procedures already mentioned (see page 169). Put on gloves. If sterile, the first glove is held by the turned back cuff, while the other hand is thrust into the glove.

The other glove is picked up with the gloved hand beneath the turned down cuff and drawn over the hand, when the cuffs are carefully turned from their underside over the wrists.





METHOD OF PUTTING ON STERILE GLOVES

Disinfect forceps in antiseptic alcohol, 70%. If an open wound, cleanse by using sterile gauze wrung out of

a mild disinfectant, generally boric solution, using forceps and curved half-lengths. Sponge away from edge of wound, using the same side of sponge only once. If a drainage case, the wick may be changed.

Cover wound with surgical gauze, over which is placed a sterile pad. Adhesive strips may be applied to hold the dressings in place. The towel with the instruments is placed on the tray; do not put in with soiled dressings.

The patient's back should be bathed with either soap and water or bathing solution, and a little powder may be sprinkled on the binder, which is now put on and the soiled binder pushed under the patient at the same time. The clean binder is adjusted, pinned, and the perineal straps applied.

Remove gloves by turning down the cuff and grasping cuff and glove together, to prevent tearing.

Dressings of the thoracic region

In breast surgery the dressing may be large or small, since these operations may vary from the removal of a small benign tumor to that of amputation for carcinoma with a complete dissection of axilla. Protect the patient from exposure by using a small blanket over the opposite shoulder. Spread sterile towels around the seat of operation.

Following the more simple operations of the breast, if the patient's condition warrants, the dressing is usually not disturbed until time for removal of stitches, 5–8 days. Before putting on the binder the axillary spaces should be bathed and powdered and pads of absorbent cotton inserted to prevent chafing.

After care of instruments

Instruments are gathered up and counted.

Place in enameled basin and wash thoroughly in cold water.

Wash in hot suds and scrub with fine sand soap, being especially careful of joints and grooved surfaces of instruments.

Rinse thoroughly in hot water.

Place on tray of sterilizer and lower into boiling water, sufficient to cover them. Boil for ten minutes.

Sharp-edged instruments should never go in with the general lot in boiling, for fear of damaging delicate edges. They should be wrapped in gauze and boiled separately.

Remove tray from sterilizer and drain. Dry with double sterile towel, avoiding contact, and place in second sterile towel.

Fold up carefully and put away ready for use.

All jointed instruments should be oiled at regular intervals.

Cleansing of utensils

All enameled ware used should be rinsed in cold water, then scrubbed with fine sand soap and sterilized five minutes.

Rubber drainage tubes should be cleansed with cold water and manipulated to detach any adherent discharge. Wash in hot soapy water and boil in weak salt solution for five minutes. Put in a separate jar of disinfectant to be used for same patient, if necessary. If not needed, destroy.

Care of rubber gloves

Wash inside and out in cold water, then in warm, soapy water, and test for leakage. Boil five minutes. Dry with sterile towel. Powder inside and out with sterile powder. Powder should never be shaken into rubber gloves. The wearer's hands perspire in the gloves, and the result after shaking in powder is a pasty deposit under the finger nails and on the tips of the fingers, interfering with the sense of touch.

The gloves should be placed on a sterile towel and the powder should be applied evenly, or stroked on from wrist to finger tips, by means of a dry sterile gauze sponge. When one side is completed the glove is turned, and the inside done in the same way. This method leaves the gloves with a satin-like smoothness inside and out. Turn back cuffs fully 2 inches. Make sure that gloves are matched. Put away in a sterile towel or glove case ready for use.

Method of mending

Test the gloves by filling with water under pressure.

The gloves should be clean and dry. Cut out a patch the size wanted from a discarded glove or from a piece of rubber dam. Stretch the glove over a test tube, if a finger is to be mended, or otherwise over some smooth, hard surface.

Apply rubber cement around the edges of the hole and as far as the patch extends, then press on the patch, which should be larger than the place to be mended.

If the cement is applied evenly and the patch held slightly stretched until the cement takes hold, the glove will stand sterilizing without loosening the patch.

Care of dry goods

Sponge covers are saved if clean. Soiled gauze is put in gauze pail. Broken packages of clean gauze are saved to be resterilized. Towels are put in laundry bag. The dressing tray is washed with soap and water and dried.

Points to remember

In getting out a dressing it should be complete in every respect, unless the doctor calls for something unusual, then see that it is added to the dressing next time.

In the preparation of solutions care must be exercised in wiping the rim of the bottles before pouring out the solutions.

In minor operations on the ward the necessary instruments are brought from the operating room.

Knives which may be used for minor operations on the ward are sterilized by placing in 5% carbolic acid or by boiling in oil ten minutes in the operating room.

When assisting at a bedside dressing do not reach over the sterile field of operation.

Have everything in readiness before scrubbing the hands. Do not leave sterile supplies open to the air. Cover until ready to use.

A bowl or basin holding a sterile solution should not be grasped with the thumb over its rim.

In removing sterile supplies from a jar the cover should be held in one hand by a sterile sponge and supplies removed with sterile forceps in the other. Otherwise the cover should be placed top down on the table.

In removing adhesive strips, the simple stretching of the skin with one hand and removal of adhesive with the other is usually sufficient; otherwise benzine or ether may be used, although the latter may sometimes be objectionable to the patient.

If an open wound, remove the dressing with the line of incision. If adherent to the wound, moisten with a sterile solution. Care should be exercised in removing wicks that become adherent, to avoid breaking down the process of repair by damaging the granulations. Apply warm sterile solution, then gradually loosen with forceps.

Warn patient not to explore dressings if for any reason he is left alone with the binder unpinned.

A nurse should never interfere with a dressing after operation unless ordered to do so by the surgeon.

Following removal of stitches, special attention should be given to the binder, to afford sufficient support.

In cleansing a wound sponge away from the edge, lest septic material from the skin surface be swept in.

In replacing a wick or drainage tube it should be grasped parallel with the end of the forceps or curved half-lengths and carried to the bottom of the wound, the remainder above the surface cut off about 1 inch above the skin, or loosely packed about the mouth of the wound; otherwise it may act as a plug and prevent drainage.

In open wounds the dressing should be sufficient to prevent leakage. Dressings which have stained through the binder should be changed and the dressing reinforced. If there is blood, report.

Instruments should be cleansed and sterilized immediately on completion of dressing. They should not be left standing in water after boiling, but should be drained and dried thoroughly. To prevent rusting of instruments in sterilizing, sodium bicarbonate to make 1% solution is used.

When putting away in the dressing towel the handles of instruments should be in the same direction.

BINDERS AND THEIR APPLICATION IN SURGERY

Straight binders are used in general surgery of the abdomen, chest, and breast, also in obstetrics, for the purpose of holding dressings in place, and for support.

These binders are made of unbleached cotton cloth or Canton flannel. When completed, they should measure 12–13 inches wide and 40 inches long.

Application to the abdomen

One-half of the binder is rolled and slipped under the patient and adjusted on each side over the hips, and below the symphysis pubis in front. One end of the binder is evenly folded under a few inches, lapped over the opposite end, and both are pinned firmly with a large safety pin at the lower edge. From that point a straight line is made to the upper edge of the binder and pinned, and a third pin secures the binder in the middle. Additional pins are added at equal distances above and below the center; usually nine pins in all. The fullness left over is taken up in darts on each side, which are fitted closely to the patient's body. When

pinning the first side equal allowance should be made for the dart on the opposite side, so that equal pressure of the binder is maintained. The pins are applied in back-stitch fashion, giving support and firmness. Finally, perineal straps are applied.

In applying a binder to an obstetrical patient, the pins are started from the top of the binder, ending at the bottom, to assist in holding the fundus of the uterus in position.

Scultetus bandage

Like the straight binder, this is applied to keep a dressing in place and for support. It is used where there may be large abdominal wounds and in obese patients with flabby abdominal muscles, as it is capable of giving greater support than the straight binder.

This binder is made of 5 Canton flannel strips 5 inches wide, which overlap each other to the extent of 2 inches, and is 48 inches long. It is reinforced by being stitched to an extra piece of Canton flannel 9 inches wide and 15 inches deep, which forms the back part of swathe, the overlapping strips or tails coming from each side. Before applying, it should be so arranged that the first underlying strip or tail should be the lower edge of the binder. It is rolled halfway and slipped under the patient. The 2 opposite strips are brought straight across and fastened firmly over the pelvis with 3 safety pins. The next 3 are crossed obliquely, inclining upward, over the abdomen, crossing each other in the center until the fifth strips are reached, which are the final ones. They are fastened straight across and

secured with safety pins. Pins are applied down the center, fastening each cross.

If a T-bandage is not attached to this binder perineal straps are used and applied, as in the case of a straight binder. As a rule, to have this binder evenly and more firmly applied, a nurse should have an assistant.

Application to the chest

Following operations of the thoracic cavity, as in empyema, where rubber drainage tubes are used, if a straight binder is worn it is adjusted under the patient's arms, and the 2 ends are pinned together over the site of the wound, so that the tubes may be carried through the vent in the binder, between the safety pins, convenient for interval irrrigations. See Carrell and Dakin's dressings, page 472.

The binder is held in by making a V of a perineal strap, the point of which is pinned to the edge of the binder between the patient's shoulders, and the 2 ends are brought over either shoulder and pinned to the binder in front.

Application to the breasts

Following a simple operation of the breast, as that of the removal of a benign tumor, the binder is pinned down the front in a straight line, and the extra fullness is disposed of by taking a dart in the binder under each breast. Perineal straps, or a folded dressing towel, serve to hold the binder in place.

For extra support and immobilization following radical operations on the breast for malignancy, 2 binders

are worn. The first binder is applied as usual, the arm space on the unaffected side being powdered and padded. A second binder is rolled halfway and slipped under the patient's back. The forearm on the affected side is held at right angles, and the end of the binder is carried over the upper arm. The other end of the binder is carried under the opposite arm as high as the axillary space and the 2 ends of the binder meet and are pinned from the shoulder to the elbow of the affected side. In addition, the forearm is supported with a wrist sling made of a dressing towel folded 6 inches wide, one end of which is pinned about the patient's wrist, the other end carried over the shoulder on that side and pinned to the front and back edges of the binder.

After 24 hours the outside binder is loosened and the arm is gently exercised and rubbed, from the elbow down. The outside binder is usually removed 3 or 4 days after operation, but the wrist sling is left on.

Perineal straps

Perineal straps serve the purpose of holding the binder firmly in place for the protection of the wound and dressing.

The straps are made of several thicknesses of bird's-eye cotton or Canton flannel about 2 inches wide and 27 inches long. The method of application depends on the region of the surgical wound; if in the abdomen, each strap is pinned to the extreme lower edge of the binder behind, brought below the prominence of the buttock, forward over the groin, and pinned to the

lower edge of the binder in front, with the patient's leg extended. The strap and binder should be under tension when pinned, and to avoid hurting the patient, the binder at its lower edge should be pulled outward or away from the wound, then downwards, to meet the strap. Any extra length of the strap should be folded under itself and pinned to the binder higher up, out of the way.

The straps should be changed at least once a day. To avoid soiling in perineal bathing and when a douche, or enema, or any other such treatment is being given, they should be unpinned in front and turned back out of the way, and be immediately replaced when through. Under no circumstances should there be less than two straps when used to hold the binder down, especially in low abdominal incisions, as in appendectomy.

When the wound is higher up, or in the epigastric region, the straps are applied to the upper edges of the binder behind the patient's shoulders, brought forward and pinned to the edges of the binder in front firmly, to prevent slipping out of place and wound exposure.

T-binders

These binders are made in the shape of the letter T, the cross section of the letter making the belt. They are used to hold dressings and pads in place following rectal or perineal operations. They are made of the same materials as binders, of double thickness, and measure in width 8 inches; in length, 35 inches. The belt is made from cotton cloth 3 inches in width and 43 inches in length.

Those used on male patients are the same width, but are divided within 6 inches of the belt.

A T-binder is applied by rolling the belt halfway and slipping the rolled part under the patient. The 2 ends of the belt are crossed in front, girdle fashion, and pinned with a large safety pin. The remainder of the T is brought up between the patient's thighs to fit snugly, then carried under and over the belt, and the end folded in a point and pinned securely with a large safety pin upon itself beneath.

LXV

DAKIN'S SOLUTION AND CARREL METHOD OF TREATMENT OF WOUNDS

Purpose

Dakin's solution combined with the careful Carrel technic is of especial value in cases of deep-seated infection, as osteomyelitis and empyema. It is very useful, also, in open uninfected wounds, to prevent development of infection, as in gunshot wounds, compound fractures, extensive burns, etc. The wound may be bathed constantly by the non-irritative antiseptic solution without retarding healing until the wound becomes sterile. Bacterial count and cultures are taken under the microscope at intervals of 2 or 3 days. By the smear, the kind of bacteria present can be found; by the culture, which is incubated for 12 hours, the number of bacteria are determined.

Preparation

A concentrated Dakin's solution is formed by mixing in water a solution of calcium hypochlorite and a solution of sodium carbonate. A volume of this solution is neutralized with hydrochloric acid and is then diluted to a .4 or .5% solution, at which per cent the necessary amount of chlorine is given off. The per cent of solution necessary to give off the desired amount of chlorine has to be worked out chemically. Soda bicarbonate is added to neutralize the solution, if acid, and to precipitate the calcium carbonate which makes Dakin's solution alkaline.

Dakin's solution deteriorates in heat and light, and should be kept in dark bottles. If kept in white bottles, potassium permanganate is added for coloring to prevent deterioration.

Equipment

pair surgical scissors
2 pairs long, straight forceps
2 pairs half lengths
flask warm sterile normal saline solution
5-pint bottle Dakin's solution
2 glass bowls { (1) saline solution; (2) Dakin's solution }
20 c.c. glass syringe
10 c.c. glass syringe
sterile instillation or Dakin's tubes
various sized glass distributors or by-way tubes, to which instillation tubes are attached
glass connecting tubes with corresponding rubber tubing
500 c.c. dark-brown irrigating bottle and wooden support for Dakin's solution
can sterile cotton pledgets
jar sterile boric ointment
jar 95% alcohol
jar benzine
metal box of sterile vaseline compresses
bottle tincture of iodine
stick of lunar caustic
sterile surgical sponges
jar sterile safety pins

6 jars sterile absorbent fluffs
sterile sweep in lysol, to remove instruments, fluffs, etc., from sterile cans
jar of sterile soap solution
kidney basin

SURGICAL CARRIAGE FOR CARREL–DAKIN DRESSING

2 enameled basins
sterile towels
large picked cotton pads
washed gauze
bandages

binders, scultetus and straight
adhesive tape of various widths
safety pins, large and small
rubber protectors

A special surgical carriage is used for the Carrel-Dakin dressings.

Dressing a wound of the thoracic cavity (empyema)

Morning dressing. The surgical carriage is taken to the patient's bedside. The bed is thoroughly screened. The patient, who is sitting up in bed, is prepared for his dressing.

The binder is taken off and the soiled dressing is removed with forceps. If one tube is used a rubber catheter projects from the wound, and is held in place with a sterile safety pin and two adhesive strips. The pus is drawn off with a 4-ounce glass syringe. Warm saline solution is then syringed into the wound and drawn off until it returns clear. It is then irrigated with the usual amount of Dakin's solution, according to the size of the cavity. The tube is clamped, the adhesive strips removed, and the skin about the wound cleansed with sterile pledgets dipped in sterile soap solution, followed by 70% alcohol, and fresh strips of adhesive are applied to hold the tube in place. Sterile gauze sponges, fluffed, are applied in such a manner as to surround the tube at its insertion to keep it from bending upon itself. An opening is made through the center of a picked cotton pad, and the clamp and tube are drawn through the opening and the binder applied

comfortably, pinned at the side from the edge on which protrude tube and clamp, convenient for 2-hourly irrigation with Dakin's solution, which is done for the remainder of the day and night.

Dressings are changed as necessary, usually twice a day. The end of the tube should be covered with a clean piece of gauze except when irrigating.

In irrigating, the syringe should be inserted into the tube before the clamp is removed, and the tube should be clamped before removal of the syringe, to prevent air entering the cavity.

In case of a rib resection, where there is an outflow tube, the cavity is syringed until the return is clear.

In some cases of empyema there may be a back and front thoracic wound containing several of these elastic tubes, when each in turn is attended to as in the case of the one tube. The scultetus binder will be found most convenient in such cases, as the end of the tubes with their clamps may be carried between the tails. Wind sterile sponge around the ends of the tubes to keep them clean.

Before application of sponges, Dakin's compresses are placed about the wound, close to the edges.

Dressing an open wound, osteomyelitis of the tibia

Carefully remove all dressing with the exception of large pads, which are laid open and which help to protect the bed. The instillation tubes should be cleaned out with Dakin's solution, using the 20 c.c. syringe until the solution runs out clear through the pin-hole per-

forations and all parts of the wound have been bathed with it. The wound is sponged dry about its edges with sterile pledgets of cotton held between the points of the forceps. The skin about the margin of the wound is washed with sterile neutral soap solution, and finally with alcohol, using sterile pledgets of cotton which are held in the forceps.

The sterile strips of Dakin's vaseline compress are now lifted out from the metal box with a sterile sweep, and carefully applied to the skin about the wound, from its margin to 3 or 4 inches beyond the wound. They are laid on smoothly so that they lie in direct contact with the skin, to protect it from the irritating action of the Dakin's solution. A heavy dressing of sterile gauze is applied and each leg is adjusted to a posterior wire splint. A large thick pad of picked cotton is applied to encircle the leg and wound, and pinned firmly together at its edges with the tubes protruding.

The irrigations are done either with a syringe or from a graduated glass reservoir, which is placed in its wooden rack above the wound. From this reservoir a rubber tube is connected with a glass distributing tube, which usually has four or more short branches or by-ways, to which are attached the rubber instillation tubes that convey the fluid into the wound. The connecting tube has a clamp for controlling the flow of solution.

LXVI

SURGICAL HAND OR FOOT SOAK

Purpose

The surgical hand and foot soak is a method of applying direct heat in the treatment of local infections of the hands or feet:

To relieve pain.

To reduce inflammation.

To disinfect and cleanse a suppurating wound before or following incision.

Equipment

cotton half sheet and rubber
rubber table cover
small gray blanket
sterile dressing towel
empty hot water bag slightly inflated
arm and foot tub
enameled basin to receive soiled dressing
sterile forceps
pair of rubber gloves
solution

If a moist dressing is to follow the soak, the following materials are added:

enameled basin containing:

sterile dressing towel
sterile sheet wadding pad
poultice paper
half sheet of wadding
small safety pins
sling, if needed
enameled pail
enameled basin
enameled pitcher
solution, as ordered

Procedure for hand soak

The patient is usually confined to bed, and, if able, sits up in bed, supported by pillows or a head rest. The half sheet and rubber are placed on the bed and across the patient's lap, to protect the bed. The infected hand is laid on the half sheet, and the dressing is unpinned, ready to be removed later.

Preparation of solution in tub

The prescribed solution is made ready: 1 to 2 gallons or more, usually boric solution, 2%, or normal saline solution, 0.6%, sylpho nathol, 1–600, or chlorinated soda 1–100 to 1–200; temperature, 110° to 115° F., or as hot as patient can bear.

The tub is placed on the bedside table or on the bed close to the patient on the side of the hand to be treated.

The dressing is now removed and the hand, evenly supported at wrist and elbow, is steadily lowered into the tub. The inflated hot water bag is placed over the edge of the tub for comfort and support of the arm.

The cover is put on the tub and reinforced with a doubled blanket to keep in the heat. In the absence of a cover a piece of rubber sheeting may be used, and a doubled blanket over the sheet.

If the soak is to be continued longer than half an hour, the solution should be replenished. If a continuous soak, the contents of the tub should be siphoned with a piece of rubber tubing, or bailed out, and filled as often as necessary, or every half-hour, with hot solution, as heat plays an important part in this treat-

ment. The fresh solution should be of the same strength as that removed.

Preparation of dressing

The sterile towel is opened and spread over the pail.

The sterile pad is removed from its cover and placed in the towel and covered.

Measure in a pint graduate sufficient solution to make 1 quart when water is added. The hot solution of required strength is now mixed in the pitcher, ready to be used later.

Removal of hand from tub

The tub is uncovered.

The second sterile towel is spread on the patient's lap, over half sheet and rubber.

The patient's hand is carefully and slowly lifted out of the tub, placed on one end of the sterile towel, and covered with the other end. The tub is removed.

Completed preparation and application of moist dressing

The sheet wadding is spread out on the half sheet, ready for the hot, moist pad and parchment paper.

Pour the solution evenly over the pad in the towel, adding the parchment paper, slightly crushed, to receive the last of the solution.

Grasp each end of towel and wring as tight as possible.

The towel is opened, and the paper is removed and placed within the folds of the sheet wadding.

The hot, wet pad is quickly wrapped about the infected surface of the hand or forearm. It is then en-

veloped with sheet wadding and parchment paper, which serve to keep in heat and hold moisture.

The sterile towel, on which the hand has been resting, is folded square, and used to envelop the moist dressing. It is put on, and graduated folds are made from the tips of the fingers to the wrist, each fold being pinned with a small safety pin until the wrist or arm is reached, resembling a thumbless mitten when finished.

Finally, if the patient is to remain in bed, a pillow with a rubber case is placed on an inclined plane at his side, so that the hand may be higher than the elbow. This relieves the pressure from the inflammation and promotes comfort to the painful part.

These pads are usually changed hourly, or every two hours, if the part is too sensitive to be disturbed.

A posterior wooden splint may be used for immobilization. If the patient is to get up, a sling is applied.

Procedure for foot soak

Loosen upper bedclothing.

Turn spread towards head of bed, out of the way.

Turn blankets and sheet even with foot of bed.

Remove surgical cradle and pillows.

Place a doubled gray blanket on the foot of the bed, tucking in just enough to hold it in place; the other end is used to draw the upper bedclothing as far as the knees.

Slip half sheet and rubber under affected foot, and over the other foot.

Owing to the fact that the feet are more sensitive

to heat than the hands, prepare the solution in the tub at a temperature of 105°–110° F.

Fold back gray blanket sidewise sufficiently to expose the affected foot, which is slightly moved to one side.

Place tub parallel with the foot.

Remove dressing.

Support foot above and below wound, or behind the knee and ankle, and steadily lower into the tub.

Place inflated bag over the edge of tub and under the knee.

Cover the tub as for hand soak.

Pull down upper bedclothing even with the foot of bed, but not to hang over, leaving the spread undisturbed.

As the time approaches for removal of the foot from tub, prepare the moist dressing, as for the hands.

Completion of foot soak

Bedclothes are folded back again.

Blanket covering the tub is folded to one side.

Cover of tub is removed.

Sterile towel is spread on half sheet and the foot placed on end of towel, and covered up with the opposite end.

The tub is removed.

Application of the moist dressing is as that of the hand soak.

The sterile towel, in which the foot has been resting, is now folded in a square, and comes next to the pad. The point of towel extending beyond the foot is turned over the toes, the sides being brought together

in graduated folds adapted to the foot and ankle. It is then pinned up the front with small safety pins.

The foot is placed on a rubber covered pillow, which is sometimes raised upon an inclined plane for greater elevation.

The surgical cradle is replaced and the clothing readjusted.

If the patient is permitted to sit up, out of bed, a wheel chair with an adjustable extension should be provided, on which is placed a pillow with a rubber case.

Disposal of dressing

If a dry dressing, it is put in the gauze pail. If a pad, the gauze is saved and the sheet wadding is put into the boiler house bag to be burned.

The tub should be thoroughly scrubbed with sand soap and sterilized in the utensil sterilizer; or filled with hot water and placed over the gas heater until the water boils. If this is not expedient, disinfect by 2% formaldehyde solution, and allow to stand for twenty minutes.

Care of nurse's hands

In the care of septic cases, the nurse must guard against infection by protecting her hands with rubber gloves. When rubber gloves are not available, abrasions, scratches, or hang nails should be protected with flexible collodion, applied on strands of sterile gauze to hold the collodion. Following the operation, each hand is scrubbed with hot suds two minutes, then rinsed and soaked in corrosive sublimate solution 1–2000.

LXVII

RENAL FUNCTION

Purpose

To determine how nearly normal the kidneys are in functioning.

Equipment

tray set with
- 2 c.c. glass syringe and needle to fit
- sterile sponges
- 1 ampule phenolphthalein
- solution bowl with alcohol

Procedure

Intramuscular

Boil glass syringe and needle. Fit needle to syringe. While syringe is sterilizing, time can be saved by having patient void. This urine is not saved.

Disinfect ampule of phenolphthalein by washing in alcohol, break end into sterile sponge, and draw contents into syringe.

Soak a sterile sponge in alcohol and carry syringe to bedside in it. Scrub patient's arm with same sponge and inject 1 c.c. phenolphthalein into the deltoid muscle. (To children ½ c.c is given.)

Note the time in writing.

The patient then drinks 20 ounces of water, and the urine secreted during the next 2 hours and ten minutes

is collected and saved. Empty into a specimen bottle properly labeled with urine slip; also record the exact time that the urine was collected.

Send at once to house officer's laboratory, where the test is completed by adding water up to 1000 c.c., and making alkaline with sodium hydroxide. The solution exhibits a red color.

Important points

Give exactly 1 c.c. of phenolphthalein.

See that the patient voids before the test is made.

Collect specimen exactly 2 hours and ten minutes after injection.

See that specimen is properly labeled.

See that specimen is not lost, but is taken at once to laboratory.

Intravenous

The arm is prepared as usual and the phenolphthalein is injected into the median cephalic vein.

Insert catheter in bladder.

Watch for appearance time of red color; normally, three minutes.

At end of first hour from appearance time collect and save specimen.

Repeat at end of second hour. Keep the 2 specimens separate.

LXVIII

CYSTOSCOPY

Purpose

For diagnosis of bladder, ureteral and renal conditions.

Preparation of patient

On the ward

The preparation varies. The usual routine is:

catharsis night before
soapsuds enema in the morning
light breakfast
local preparation; shave not necessary, though preferred by some doctors
medication as ordered, morphia, ⅙ grain, or scopolamine, $\frac{1}{150}$ grain, or both

In the operating room

Preparation of 3 or more sterile specimen bottles as follows:

catheter specimen, marked with name, date, service, and ward
right ureter specimen, marked "R," with name, date, service, and ward
left ureter specimen, marked "L," with name, date, service, and ward

Drape patient in lithotomy position.
Catheterize patient and save specimen.
Inject 20–30 c.c. cocaine lubricant into urethra with a 30 c.c. glass syringe.
Prepare boric acid, 2% solution for bladder irrigation, amount depending on condition in bladder and urine.

Procedure

By the doctor

The cystoscope is introduced, and the bladder explored thoroughly in order to determine the presence of stone, tumor, ulceration, or any other lesion. The ureteral openings are also explored, noting swelling, pus, or blood from ureters. By watching contractions of ureteral openings, and intervals between them, information is gained of the activity of the kidney. Certain drugs, as indigo carmin, which color the urine, may be given to make the urinary whirl visible when ureteral orifices are not seen, due to pathological bladder. In case of normal kidney the colored stream should appear in the bladder in fifteen to thirty minutes after taking of drug by mouth; intramuscularly, in five to seven minutes; intravenously, in three to five minutes.

The bladder is irrigated with boric solution before passing the ureteral catheters, in order to clean the bladder walls. Specimens are obtained from both ureters. Throughout the procedure the nurse assists by holding the cystoscope, firmly, and the basin to receive

return of irrigation. Most of the pain in cystoscopy can be avoided by holding the cystoscope firmly.

After examination the patient may need morphia and a warm enema, which may act as a sedative.

Care of catheters

The caliber of the catheters is so small that to clean them it is necessary to use a 2 c.c. syringe for forcible injection of soap and water, followed by ether. They are then formalized for twenty minutes in Schering's formalin sterilizer.

LXIX

BLADDER IRRIGATION AND INSTILLATION

IRRIGATION

Purposes

Some of these are:

For cleansing and relief of inflammation of the bladder in cystitis.

For stimulation and distention when the bladder walls may be contracted. In such cases the amount of solution used is small at first and gradually increased.

For washing out the bladder after residual urine has been removed by catheterization.

Equipment

gray blanket
large sheet
half sheet and rubber
tray containing
  2 sterile rubber catheters, size 16–20, French, in a sterile towel
  sterile lubricant
  4 packages sterile picked cotton sponges
  sterile funnel and tubing with glass pipette attached
  sterile pint graduate
  kidney basin
  clean enameled pitcher and basin
  dairy thermometer
  2 finger bowls, one with hot, soapy solution and the other with hot boric solution, 2%

Preparation of the solution

A pint or more of 2% boric solution is usually prescribed for a bladder irrigation at a temperature of 105°–110° F. The solution is prepared in a sterile graduate and placed in a pitcher of hot water to hold the heat. The dairy thermometer, which has been disinfected in a solution 1–1000 corrosive sublimate, is placed in the graduate. Cover with a sterile towel and carry to the bedside in a basin.

Preparation of patient and nurse

The preparation of the patient and of the nurse's hands is the same as that in catheterization. See page 168.

Procedure

Following catheterization, the outer end of the catheter is wrapped in a sterile sponge and the kidney basin removed. The sterile towel with the extra catheter and sponges is folded back out of the way. The temperature of the boric solution is noted, the thermometer put to one side, and the graduate removed from the pitcher of hot water and placed in the basin. The basin is placed on the bed, and the sterile towel containing the funnel is placed on the foot of the bed and opened. A utensil is placed on a chair to receive the bladder washings. The nurse dips her hands in the boric solution in the finger bowl, picks up the funnel and tubing, and expels the air by pouring in some of the solution and allowing a little to run out, then pinching the tube to hold in the remainder. The pipette

is then slipped into the end of the catheter and a small amount of the boric solution, the amount depending on bladder distention or discomfort, usually 5 ounces, is poured into the funnel and the tubing is relaxed, the solution is allowed to run slowly into the bladder, being constantly regulated by slightly pinching the tube and slowly elevating the funnel without allowing the tubing to empty itself completely. After the solution is held in the bladder for a moment the funnel is quickly inverted over the basin, starting up a siphonage. Before the tubing is quite empty it is pinched, and more of the solution is poured into the funnel, a repetition of this procedure being carried on either until the outflow is free from sediment and runs clear, or until the solution is used up.

In some cases the nurse is told to let the patient retain the last funnelful of solution for further disinfection of the bladder. Sometimes an argyrol or mercurochrome, 10%, instillation may follow the irrigation of the bladder for the same purpose. Silver nitrate 1/8000 irrigation is frequently used following boric irrigation.

On the completion of the irrigation the pipette is disconnected from the catheter and the catheter pinched and slowly removed from the urethra. The patient is dried and the extra blanket, half sheet, and rubber are removed, and the patient made comfortable.

Observe the bladder washings for pus, blood, sediment, shreds of mucus, or anything unusual.

The funnel and tubing are washed, boiled, and put away with sterile precautions. The catheters are cared for as in catheterization.

INSTILLATION OF BLADDER

For this operation a long rubber catheter is used. The bladder is emptied and irrigated with 2% boric solution. With the catheter still in position the drug for treatment is drawn into a half ounce glass syringe. The air is expelled and the tip of the syringe directed into the external end of the catheter.

To prevent escape of drug, the catheter and syringe are withdrawn without disconnecting.

In the case of bladder infections, the drug ordinarily prescribed is argyrol, 10%, and olive oil, ½ ounce. In the case of an irritated bladder, oil of eucalyptol, 1 part, and olive oil, 99 parts, may be used. The drug is retained in the bladder until the normal urinary discharge takes place.

INSTILLATION OF THE URETHRA

This procedure is carried out in cases of gonorrheal urethritis. The drug is carefully introduced into the urethra by means of a small glass syringe with a blunt tip. The quantity usually prescribed is 10–30 c.c. Some of the drugs used are argyrol, 10%, mercurochrome, 1%.

LXX

APPLICATION OF A FEMALE SELF-RETAINING CATHETER

Purpose

This procedure is followed sometimes to avoid distention of the bladder by urine after operations on the bladder walls; and in some cases of incontinence, following vulvectomy and certain plastic operations.

Preparation

The local preparation of the patient and of the nurse's hands is done as if for a catheterization.

Equipment

Excepting the catheters, the equipment is the same as that used in catheterization. A special self-retaining mushroom-tipped or scroll-tipped catheter is used, and a stillet to aid its insertion into the bladder. A clean five-pint bottle and retainer, 3 feet of half-inch sterile rubber tubing, glass connecting tube, and adhesive plaster are also needed.

Procedure

The stillet is inserted into the catheter as far as it will go. The mushroom-tipped end of the catheter is drawn tightly over the point of the stillet until it no longer bulges, is then held in place, and slowly introduced into

the urethra until it is beyond the internal sphincter, *i.e.,* about 2 inches of the catheter are inserted. The stillet is carefully withdrawn, leaving the catheter in position, and the bladder is drained into the kidney basin. A glass pipette is inserted into a 3-foot length of rubber tubing and connected with the catheter. The retainer with the bottle in it is suspended at the side of the bed and the free end of the rubber tubing is dropped into the bottle, into which the bladder will drain. To hold the catheter in place, its outer end at the margin of the pipette is strapped to the back of the patient's thigh with adhesive tape. Another piece is applied around the tubing, long enough to permit fastening to the side of the bed with a safety pin.

Daily supervision of bladder drainage

The rubber tubing is usually detached from the catheter twice a day and syringed out with hot 2% boric solution, to keep it clean.

Irrigations of the bladder when on drainage

The bladder is sometimes irrigated following operations on its walls, to keep the stitches clean and to wash out blood clots, if any are present.

A pint of sterile boric solution 2% at 110° F. is prepared. The rubber tubing is detached from the catheter at the pipette, and the funnel and tubing for bladder irrigation are used. The tubing is filled with solution and pinched. The pipette is then introduced into the stationary catheter and from 3 to 4 ounces of the solution

is allowed to run into the bladder slowly, as sudden distention must be avoided. The pipette is then disconnected and the return solution runs out into the receptacle. This operation is repeated until the solution runs clear from the bladder.

Sometimes a 4 to 6-ounce glass or metal G. U. syringe is used instead of a funnel and tubing. Care must be taken that the solution is injected slowly through the catheter.

After irrigation the stationary catheter is again connected with the rubber tubing, which has been cleansed, and its end is dropped into the bottle. The catheter is left in the bladder from three to four days as a rule. If it must remain for a longer period it should be removed, washed, sterilized, and replaced.

LXXI

EYE TREATMENTS

EYE EXAMINATION

Equipment

ophthalmoscope
drop light

Drops may be ordered by the house officer.

HOT APPLICATIONS

Purpose

These applications are applied in the form of moist heat to relieve painful inflammatory affections of the eye, as in conjunctivitis and iritis.

Equipment

tray with
enameled fomentation cup
2 throat sticks
boric solution, 1–25
pledgets of absorbent cotton
bath thermometer
rubber protector for the bed
paper bag
electric or gas plate
boric acid ointment or olive oil

Procedure

The patient lies flat on his back. The rubber protector is slipped under his head and shoulders. The towel is folded diagonally and the point brought to the side of the head to be treated, and the corners of the towel tucked in on the opposite side. The nurse should always scrub her hands thoroughly before starting any treatment on a patient's eyes.

Measure 6 ounces of 1–25 boric acid solution into the fomentation cup and heat the solution to 125° F., then put several pledgets into the solution at a time. To avoid the danger of burning the patient, before applying the hot pledgets carefully lubricate the eyelid, including the margin of the lower lid and surrounding area. The ointment must not be permitted to get between the lids, since this would irritate the eye. As a further precaution, the pledgets are squeezed as dry as possible before application by making firm pressure with the throat stick.

The pledgets are usually applied constantly for fifteen minutes out of every hour. Following the application of moist dressings to the eyelids, they should be carefully and gently dried.

COLD APPLICATIONS

Purpose

Cold, moist applications are frequently prescribed in conjuctivitis and in the inflammatory affections of the glands of the eyelids, as hordeolum, or stye, and chalazion (hailstone), a small tumor on the margin of the eyelid.

Equipment

tray with
- dressing towel
- pledgets of absorbent cotton
- 2 throat sticks
- boric solution, 1–25
- pint enameled basin
- lump of ice
- rubber protector
- small paper bag

Procedure

The position of the patient and arrangement of the protector and towel are the same as in the case of hot applications.

Place the ice in the basin, measure 10 ounces of boric solution, and pour over the ice. Place cotton pledgets on the ice and carry all equipment to bedside.

Squeeze the pledgets almost dry between the 2 opposing surfaces of the throat sticks, and apply directly to the closed eyelid. Continue to change these pledgets constantly for ten minutes, or longer, until relief is obtained. The pledgets are discarded as used and placed in the paper bag to be burned. This rule should always be observed in cases of infection.

APPLICATION OF OINTMENT OR POWDER

Ointment

Ointment should be applied to the conjunctiva of the lower lid and then the upper lid be carefully pulled

down over the lower. If ointment is not in a tube, apply with a toothpick applicator. If ointments have been used frequently, it may be well to use a wisp of cotton with each lid to prevent the fingers from slipping during the treatment.

Powder

Powder should be sprinkled on the lower lid with a toothpick applicator and the upper lid be pulled down, as above.

To open lids

The upper lid should be pulled toward the frontal bone and the lower lid toward the cheek. Care should be taken never to press on the eye.

IRRIGATIONS

As to the relative value of medicine droppers and eyecups for irrigating or washing the eye, the dropper is considered the safer of the two, because in the use of an eyecup there is danger that any bacteria which might be on the lids may be washed into the eye itself. In working on the eyes be careful never to use force at any time.

Purpose

Irrigations are done for the purpose of cleansing the eyes, and for antiseptic effect in conjunctivitis. Irrigations precede all medications of the eyes, unless otherwise prescribed.

Equipment

4 small enameled basins
jar of sterile glass medicine droppers
jar of sterile pledgets
boric solution, 1–25
corrosive sublimate, 1–2000
dressing towel
rubber protector for bed

The equipment is arranged on a tray and placed on a table near the foot of the bed.

In one of the four basins is 8 ounces of warm (90°–95° F.) boric solution, in another, warm corrosive sublimate solution for the nurse's hands. One of the two remaining basins serves as a receptacle for the droppers after use. The other is for the discarded pledgets.

Procedure

The patient lies flat with his head at the foot of the bed. The protector is slipped under his head and shoulders and the towel arranged about neck and ears for protection. The nurse, after scrubbing her hands, proceeds with the operation, doing the unaffected eye first. She stands back of the patient, at his head, and carefully opens the lids by making pressure with the index finger on the frontal bone, in the region of the supra-orbital bone above the eye, and with the thumb on the superior maxillary bone below. Never make pressure on the eye itself.

A pledget of cotton may be placed at the outer canthus to prevent too rapid escape of the solution. With

the other hand one of the droppers is filled with the warm boric solution and held horizontally with the patient's eye, the body of the dropper resting on the bridge of the nose, and the eye is irrigated from the inner canthus near the nose. Never point the dropper straight toward the eye, or irrigate directly into the cornea. The affected eye is then irrigated until the eye is clean. In the case of children, cotton pledgets are used in place of droppers.

After the irrigation the dropper is discarded, and another one used if medication is prescribed which calls for the same method as irrigation. It is unnecessary to put more than 2 drops in the eye at one time, since the conjunctival sac will not hold more.

After care of droppers

In caring for the eye droppers afterwards, they should be carefully washed in hot soapsuds, boiled for ten minutes, and after they are perfectly dry, returned to the sterile jar, which should have sterile absorbent cotton in the bottom to protect the fragile tips of the droppers. The jar is covered when not in use.

Droppers for different drugs

To prevent the use of the same dropper in different solutions, which might prove serious in treatment of the patient's eyes, droppers having different colored bulbs are employed as a means of identification, *i.e.*, for

Mydriatics, drugs which dilate the pupil, *red bulbs*

Myotics, drugs which contract the pupil, *white bulbs*

Antiseptics, drugs which neither dilate nor contract, *black bulbs*

REMOVAL OF FOREIGN BODIES

One of the simplest and most effective ways of removing at once particles of sand or cinders from the eye is for the person to grasp the upper eyelid in the middle with thumb and index finger and with an outward and downward motion allow the lid to sweep over the eyelashes of the lower lid. This may have to be repeated, but usually relieves the first time. Always refrain from rubbing the affected eye.

The presence of a foreign body in the eye is extremely painful because of the rich nerve supply of the conjunctiva and cornea. For this reason a local anæsthetic is usually instilled before any attempt is made to remove the foreign body. The anæsthetics used may be cocaine solution, 4%, holocaine, 1–2%, or butyn, 2%. Holocaine is sometimes used in preference to cocaine because it accomplishes the purpose without drying the cornea or dilating the pupil.

Foreign bodies usually consist of particles of dust, cinders, eyelashes, etc., which may be removed by simple irrigation of the eye, using a medicine dropper with warm boric solution, 1–25, normal saline solution, or sterile water, although water is irritating if used to any extent for irrigating purposes. To the patient it sometimes seems as if the particle was in the cornea, because of the pain, when it is really imbedded in the conjuctiva of the upper lid. In such cases the eyelid should be everted so that it may be removed.

To do this, have the patient look down, then use a toothpick, match, or pencil in one hand to press down the upper lid, while with the other hand grasp the eye-

lashes and turn the lid out and up, over the instrument used, then with a cotton swab quickly dislodge the particle. To return the lid to its normal position, have the patient look up; this permits the lid to roll back. When one becomes proficient in everting the eyelid, it can be done entirely with one finger.

Care should be taken to remove the entire foreign body. If only part of it is removed, the remainder may cause an infection of the eye which may be serious. Stains from iron or emery are always entirely removed. Any foreign body on the cornea is a menace to the eye because an abrasion of the cornea in the presence of an infected tear sac may lead to a corneal ulcer, and at times to the loss of the eye.

To relieve the irritation following removal of a foreign body, zinc sulphate solution, ⅛ of 1%, is used, combined with holocaine, 1%, or an instillation of argyrol, 20 to 25%, or mercurochrome, 1–2%.

Any particle imbedded in the eyeball, such as emery or steel, should be removed by a doctor, and as first aid a light dressing may be applied for comfort until the eye can be cared for. The patient should be cautioned not to rub the injured eye, as it only serves to increase the irritation.

INSTILLATIONS OF THE EYE

Mydriatics

All mydriatics are used for ocular refraction, also frequently for treating certain eye diseases.

For refraction

The drugs most commonly used are homatropine and atropine.

Homatropine, 2%, 1 drop is instilled into each eye every ten minutes for 1½ hours. In giving homatropine, the nurse should write on paper the time and number of doses to be given, and check off each dose when given.

Atropine sulphate, ½%, 1 drop is instilled into each eye 3 times a day for 3 days. This is usually done at home.

In an office or clinic the patient is permitted to sit upright in a chair and incline his head backward, resting it against the wall. The bottle, dropper, and cotton ball should be placed near the patient. The nurse stands in front of the patient, holding the dropper in the horizontal position, at the same time requesting the patient to open both eyes and look up to the ceiling. With the thumb and index finger the lids are separated and the drop is placed in the middle of the lower *cul-de-sac* of the eye.

In using atropine sulphate it is wise to instruct the patient to make pressure at the internal canthus in order to prevent the poisonous drug from entering the nasopharynx through the lacrimal ducts. All mydriatics are poisonous.

For irrigation and treatment of certain diseases

The patient lies in horizontal position with the nurse standing.

Always irrigate both eyes with boric solution, doing the well eye first. Fill the dropper with solution and

irrigate until the eye inside and out is clear and free from secretions. Instill the solution a little nearer the external canthus in order to flush the whole eyeball.

Follow irrigation with medicinal drops.

Ointment should be put in last if ordered.

Myotics

The chief uses of myotics are:

In glaucoma cases, when the intraocular pressure has increased; this helps to decrease the obstruction at the anterior angle.

To counteract a mydriatic.

In paralysis of accommodation, when the pupil is dilated; the myotic stimulates the ciliary muscle.

In cases of iritis or iridocyclitis with dilated pupil, showing any evidence of secondary glaucoma with increased tension. Pilocarpine is alternated with atropine and observed very closely.

Caustics

As an illustration of the use of caustics the treatment of Trachoma is given.

Trachoma is a contagious disease of the eyes, characterized by granules in the conjunctiva of the lids.

Nursing care

Special precautions are observed and the patient is isolated.

Boric acid, 3%, irrigations are given 3 or 4 times a day.

A compound zinc oxide ointment, half strength, is applied 4 times a day.

Boric ointment is applied at bedtime.

Copper sulphate stick (blue vitriol), 10%, a caustic, is used by the doctor either once a day or every other day, just as the patient can stand it, for the pain resulting from the use of copper stick is intense. When the inflammation has begun to subside, the use of the copper stick is decreased and a mixture of glycerite of copper, 1–20, is substituted. Instill 1 drop of this solution into the eyes 3 times a day.

The copper stick is generally used, however, once each week. As the patient becomes accustomed to the solution of copper, each day decrease the drops of water, and work up a tolerance until he can stand the solution at full strength. It is seldom that a solution stronger than 1–10 can be tolerated.

RESTRAINT AND POSITION OF A CHILD FOR EYE, EAR, NOSE AND THROAT TREATMENTS

Method I

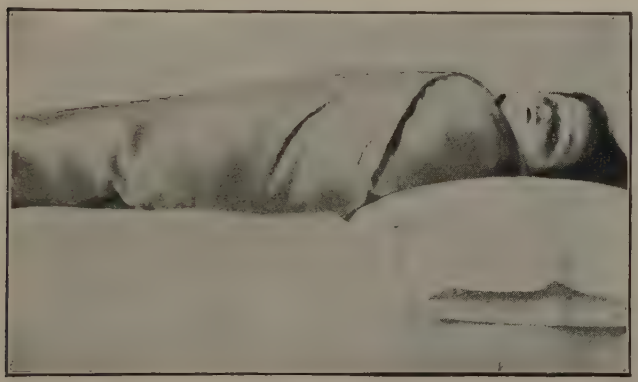
Equipment

1 blanket or sheet
3 large safety pins

Procedure

Fold the blanket or sheet to form a rectangle. Lay the child on the blanket so that the folded edge of the blanket will come well up to the neck. Fold the blanket firmly over the child diagonally across the chest, from the left to the right. Likewise, fold the blanket from the right to the left, covering the entire body and form-

ing a "V" at the neck. Pin the blanket at the shoulder, knees, and ankles. By using this method the child can be held securely by one person for irrigation or treatment.



METHOD I

Method II. For eye treatments

Equipment

1 stool or child's low chair
1 bedside chair
1 small rubber sheet
1 half sheet

Procedure

The nurse should sit in the large chair with the patient in front of her, sitting on the stool. Place the rubber sheet, which has been covered with the half sheet, on her lap. The child should lie back with its head between the nurse's knees.

METHOD II

Because of the importance of the nursing care, cataract and ophthalmia neonatorum have been added to the eye treatments.

CATARACT

Cataract is a disease of the eye manifested by partial or complete loss of sight due to pathological changes in the crystalline lens, causing opacity. This disease may be congenital, it may follow injury to the eye, and is most common in senility.

Operation is resorted to for the removal of cataract. Such an operation is a great strain on the patient nervously, since by necessity it is done under local anæsthesia, because the restlessness and straining that usually follow general anæsthesia may result in permanent damage to the eye by causing the vitreous humor, which is a semi-fluid, to escape.

On entrance to the hospital these patients have a physical examination and urine test before operation.

Equipment for local preparation

tray with
- pair small curved scissors
- boric acid ointment
- 4 small enameled bowls
  - (1) warm boric acid solution, 2%
  - (2) soap solution
  - (3) sterile water
  - (4) corrosive sublimate, 1–10000
- jar sterile cotton pledgets
- bottle of homatropine, 1%
- 1 sterile eyepad—2 by 2½ inches
- cotton bandage—1½-inch

The sterile eyepad is made of absorbent cotton, with a layer of muslin covering the inner surface which comes next to the patient's eye.

Procedure

The patient sits on a low-backed chair, and the first step in the preparation is clipping the cilia, or eyelashes. To prevent the clipped lashes from falling into the eye, the points of the scissors are smeared with boric acid ointment on a pledget of cotton. The nurse stands behind the chair at the patient's back and supports his head with her arm to steady it, at the same time reassuring the patient. With the curved point of the scissors directed away from the patient's eyes, she

clips the eyelashes of the upper lid, wiping off the scissors on the ointment covered pledget after each clip. In removing the eyelashes from the lower lid, the nurse holds the upper eyelid out of the way to prevent the patient from winking while she clips the lashes. Each eye is now irrigated with the boric solution, starting with the unaffected eye, and if medicinal drops are ordered they are now introduced.

The patient's hair is smoothed back, and a clean cotton head covering, like a nightcap with strings, is put on, and the strings tied at the side out of the way. The patient is now instructed to close his eyes, and the area about the affected eye is prepared, the supra-orbital bone, which includes the eyebrow, the bridge of the nose, and superior maxillary, well down on the cheek.

Using a fresh pledget of cotton with each solution, beginning with the soap solution, washing off the soap solution with the sterile water, finally the corrosive sublimate solution, the area about the eye is sponged dry, the pad is placed over the eye, and the bandage applied to hold the pad in place.

A red pencil mark is made upon the cheek under the eye to be operated on. Under no circumstances should this be overlooked.

Post-operative treatment

On completion of the operation a pad is placed over both eyes, fastened down at each side with court plaster, and a single knitted bandage is applied over both eyes and secured at the side of the head with four tapes.

After the operation the patient is moved to the ward

in the same bed in which he was operated on. Stretchers are seldom used, as the jar causes injury to the operated eye.

The patient should be instructed to lie quietly on his back for 4 hours, after which he may be turned to the side opposite the operated eye. The patient should not move without assistance for the first 24 hours.

Any nausea or desire to cough should be reported and be treated at once. Codeine, grain, ½, by mouth may be prescribed.

Dressings

Both eyes should have a sterile dressing and be bandaged for 3 days.

Diet

For the first 12 to 24 hours a very light diet (soft-solid) without milk, followed by house diet, unless ordered to the contrary.

Catharsis

None for 2 days following operation. Enema on the third day.

Care of the eyes

The patient should remain in bed until the fourth day, with both eyes bandaged. On the fourth day the well eye may be uncovered and the patient be allowed to sit up. During this time a shade that covers both eyes should be worn. The patient should be in a semi-lighted room, as a bright light is very uncomfortable.

When both eyes are uncovered, usually the eighth day, the patient should be provided with a pair of dark glasses. Under no circumstances allow a patient to wear his own glasses.

THE BLACK RING MASK

A black Ring mask should be worn at night for at least 2 weeks following the operation.

The patient is discharged with dark glasses.

OPHTHALMIA NEONATORUM

Ophthalmia neonatorum is a contagious disease caused by several different organisms—the gonococcus, pneumococcus, staphylococcus, streptococcus, etc. The gonococcus causes a much larger percentage of the disease than any other organism. This infection is manifested by severe inflammation of the eyes and conjunctiva with a purulent discharge. This disease used to cause about 50% of all blindness, but now causes only 17%. Much of this decrease is due to the mechanical cleansing of the eyes with boric solution, followed with instillations of nitrate of silver solution in the eyes of the new-born before they are taken from the delivery room. This is known as Credes' method of prophylaxis.

Besides the new-born who have been infected from the mother during birth, adults may become infected either through carelessness, by infecting their hands and then rubbing their eyes, or by using soiled towels which

have come in contact with the organism. Doctors and nurses may be infected by accident during a delivery or when giving a treatment, by a drop of pus entering the eye. In such an emergency avoid rubbing the eye and report at once for treatment, which consists of irrigation by boric acid, 3%, followed by instillations of argyrol, 25%.

The nurse should wear glasses and gown for protection, keep her hands away from her face and hair, and scrub her hands thoroughly between each case. All discarded material is burned and all utensils sterilized.

Methods of protecting the unaffected eye

When only one eye is infected care must be taken not to spread the infection to the clean eye. As long as there are no signs of irritation the clean eye is not irrigated, as in other eye treatments. The infant should lie on the side of the infected eye, so that the discharge will not drain into the unaffected eye. If he is restless, the mattress behind his back may be elevated by tucking a small pillow or folded blanket under it, or the infant pinned down in blankets. Sometimes an artificial bridge of absorbent cotton and collodion is made on the infant's nose to prevent the discharge from passing into the clean eye. Another method of protection sometimes used is to apply iodoform powder to the clean eye with a toothpick swab, and over that a pad is applied, held in place with a gauze bandage. Additional padding should be placed under the bandage where it passed over the bridge of the nose, to ward off any discharge. This dressing should be changed every day, and

the eye closely observed. If any irritation, the bandage is omitted, and the condition reported. A bandage is never applied over the infected eye.

Buller's shield

A Buller's shield, which is used to protect the eye of an adult or child against infection, is too large for an infant, as it would almost rest upon the eye itself.

Method of making the shield

Use an ordinary watch crystal and 2 pieces of adhesive plaster, 1 of which should be 2½ inches square, the other, 3 inches square. Cut a hole 1 inch in diameter out of the center of each piece of adhesive plaster. Attach the smaller piece to the concave or under side of the crystal, and the larger to the convex or outside of the crystal. The outside piece of adhesive being larger, allows a margin for attachment to the patient's skin.

The shield is now ready to place over the clean eye, and in order to permit entrance of air to the eye, without danger of infection, a small corner is snipped from the adhesive on the shield on the temporal side. A little absorbent cotton is placed under the adhesive plaster near the bridge of the nose. Finally small wisps of absorbent cotton are fastened with collodion about the edges of the adhesive plaster for reinforcement against leakage from the affected eye.

The shield may be left on for 2 or 3 days without changing unless signs of irritation are evident.

Before applying Buller's shield, careful examination

of the eye is made for any conjunctival redness, or the presence of any discharge, and the eye thoroughly cleansed and dried.

Irrigation

If the infant's eyes are badly swollen on admission to the hospital, cold compresses may be applied for ten to fifteen minutes every hour or every 2 hours. These are discontinued after 24–48 hours. The eyes are irrigated with boric solution, 3%, every hour. If the discharge is very profuse, the eye may be irrigated every ten or fifteen minutes, or as often as necessary to observe absolute cleanliness. For this purpose a small Davol syringe is used, or a dropper with a piece of fine rubber tubing attached. All the discharge must be removed from the eye at each irrigation. The pus forms very rapidly, so that often the lids are bulged out from the pressure. Then when the lids are opened the pus escapes in a stream, and in these cases the nurse must guard against infection. If accidentally infected, she should report at once for treatment.

Zinc sulphate solution, 1/10 of 1%, is a mild antiseptic, which may safely be used every 2 hours. Sometimes a solution of mercurochrome, 1%–2%, is used, alternating every 2 hours with a solution of protargol, 4%, or a solution of argyrol, 25%. Again the mercurochrome may be used every 2 hours for 3–4 days and then either protargol or argyrol used for 3–4 days. They cannot be used indefinitely because of the danger of staining the eye brown.

If the condition is very obstinate, silver nitrate solu-

tion, 1–2%, may be swabbed on the mucous membrane lining the lids once a day by the doctor, as it has specific action on the pus cells. This treatment causes increased swelling and discharge temporarily but is very efficacious in clearing up such discharge. Boric acid ointment is always applied freely to the lids to prevent them from adhering together, and also to keep the skin soft and free from irritation.

Atropine solution is used very cautiously with infants because of the danger of poisoning. Atropine ointment is used for infants once or twice a day in preference to a solution. With adults a solution of atropine, 1%, is used 3 times a day until the pupil is well dilated. After that, enough is used to keep the pupil dilated and at rest.

One serious complication that may arise is a corneal ulcer. In an infant, if treatment is started soon enough and the eye kept free from pus, the ulcer will not form. In an adult ulcers may form even with the most careful treatment. Frequently these perforate with a resulting loss of vision.

When a patient has an ulcer he is always kept in bed and as quiet as possible to lessen the danger of perforation. Mydriasis must always be kept up at this time to prevent adhesions of the iris forming.

The amount of vision lost depends on the size of the ulcer and the location. If it is in front of the pupil, more vision will be lost than if the ulcer is near the margin of the cornea. After the ulcer has healed yellow oxide of mercury may be applied to the eye and the lid massaged carefully.

For severe pain in the eye a solution of dionine, 2%, an alkaloid of morphine, may be instilled when necessary. Aspirin is almost considered a specific for eye pain, so that grain X may be given every 4 hours. For very severe pain codeine or morphine may be given.

In adults with a systemic gonococcus infection, general treatment must not be overlooked. Whenever possible infants who have been breast fed should continue having breast milk. It has been proved that this is indirectly conducive to shortening the course of the disease. Patients with gonococcus infections are kept on precautions until the eyes are free from discharge and 3 consecutive smears have proved to be negative.

LXXII

TREATMENTS OF EAR, NOSE, AND THROAT

EAR EXAMINATION

Equipment

graduated set ear speculums
toothpick swabs, points thoroughly covered
kidney basin
extra cotton
ear forceps
drop light
head mirror

EAR IRRIGATIONS

Purpose

For the cleansing and therapeutic effect of heat, following a paracentesis of the drum membrane in acute otitis media.

For cleansing purposes in suppurating ears.

To dislodge excess and impacted cerumen of the canal.

To dislodge epithelial plugs, a collection of epithelial cells due to dryness of the skin in the external canal.

To dislodge foreign bodies in the external canal.

Equipment

irrigating stand
irrigating can with 5 feet of rubber tubing and a metal clamp

sterile medicine dropper, its bulb removed and its tip covered with sterile fine rubber tubing 2 inches long
sterile toothpick swabs
kidney basin
pint graduate
2 large pitchers { (1) hot solution / (2) cold solution
enameled basin

Procedure

Prepare 1 to 2 quarts of solution as ordered, usually saline, and at 110°–112° F., if the patient can tolerate it. Pour the solution into the can, which should be elevated not more than 3 feet above the patient's head. Attach the medicine dropper to the tubing of the irrigating can to serve as irrigator. In irrigating the ear of an adult, or child over 8 years of age, it is best to have the patient sit up in a chair beside the irrigation stand. Cover the patient's shoulders with the rubber cape and towel. If the patient is able, he may assist by holding the kidney basin close to his neck below the affected ear.

Before irrigating, a little of the solution is run out into the empty basin to let out the air and equalize the temperature of the solution. Pull the auricle upward and backward with one hand; with the other, rotate the tip of the irrigator in the external part of the canal, always directing the stream toward the canal instead of straight toward the drum membrane. The irrigation is continued until the return flow is clear, or until about 1 quart of the solution has been used. Finally, wipe the ear perfectly dry with cotton swabs.

If any drops are ordered they are put in the ear after irrigation. In order to get the desired effect, have the patient incline his head in the direction opposite to that of the affected ear.

Irrigation of an infant's ear

The equipment is the same as that for the adult. It is almost always necessary to resort to the blanket restraint, and therefore the infant will have to be lying down. The irrigating can should be not more than 2 feet above the patient's ears. The auricle should be directed down and back. The irrigating rubber tip should not be permitted to pass beyond the entrance of the canal, as in the infant the canal is very shallow.

Cerumen

Impaction in the ear of cerumen, or wax, is apt to interfere with the hearing, and give rise to other local discomforts from pressure on the ear drum. In some cases, in order to loosen the wax before syringing, a few drops of hydrogen peroxide are instilled into the ear and held for a few minutes.

It is usually necessary to use force in syringing to dislodge the wax, and for this purpose a large metal or glass syringe is used, and a warm solution of soda bicarbonate, 10%. The tip of the syringe is supported between the index and third finger of one hand; the other supports or steadies the patient's head, to prevent any injury to the ear should the patient move his head suddenly. When the operation is over, the external canal should be thoroughly dried with sterile pledgets of cotton. If the ear is sensitive to the air, a piece of

cotton is placed over the external opening for a few days.

FOREIGN BODIES

Hard foreign bodies may be found in the ears of children, who in play may insert peas, beans, seeds or buttons into the external canal. Such cases should not be tampered with by unskilled hands because of the danger of pushing the obstructing body farther in and against the delicate structure behind it. If the foreign body be a vegetable seed of any kind, a few drops of alcohol are instilled into the external canal and held for ten or fifteen minutes to dehydrate the seed and cause it to shrivel; followed by instillations of sweet oil, when it may be more readily removed. Irrigations of water should not be used, as it tends to swell the seed.

The accidental entrance of a winged insect may be the cause of great discomfort. Sometimes instillations of warm saline solution or warm oil will hold the wings together and relieve the pain until the ear is syringed out. A few drops of chloroform or ether may be used to kill the insect.

PREPARATION FOR MASTOID OPERATION

Equipment

tray with
- safety or straight razor
- 4 small basins
  - (1) water
  - (2) soap solution
  - (3) corrosive solution, 1–10000, or alcohol
  - (4) for waste

4-inch sterile gauze
package 1½-inch bandage
collodion
red pencil
adhesive plaster
equipment for irrigation

General preparation

Night before
bath
shampoo
light supper
water to drink during night

Morning
soapsuds enema

Local preparation

Part the hair off in a semicircle before cutting. Shave the mastoid area an inch over the ear unless otherwise ordered. If a woman, leave a lock of hair in front of the ear. Braid the hair closely and fasten all hair away from the area with a semicircular strip of gauze covered with collodion.

Irrigate the ear as for an irrigation treatment. Wipe the canal dry. Scrub the area with soap solution, water, corrosive solution, or alcohol. Then apply a sterile dressing and a bandage. If the ear protrudes, put sufficient gauze behind the auricle to prevent its being pressed against the head and causing pain. Mark the cheek of the operative ear with a red pencil.

Radical mastoid

The field should be shaved for about 2 inches back of the ear. In other respects the procedure is the same as for simple mastoid.

In addition a skin graft may be undertaken. Then, unless otherwise ordered, the right thigh is shaved, scrubbed, and a sterile towel is bandaged on. It is well to apply strips of adhesive plaster at top and bottom of the dressing so it will remain secure if the patient moves.

NASAL IRRIGATIONS

Purpose

To apply heat and remove discharge from the nose in chronic rhinitis and sinusitis.

To remove crusts and neutralize odor in atrophic rhinitis and ozena.

Equipment

irrigating stand
irrigating can, to which is attached 5 feet of rubber tubing and metal clamp
glass nasal douche tip
basin
rubber cape
dressing towel
bath thermometer
measuring glass
1–2 quarts sterile saline solution

Procedure

Prepare 1–2 quarts of solution as ordered, at a temperature of 110°–112° F. Those most frequently used are normal salt solution, potassium permanganate solution, 1–6000, soda bicarbonate solution, 1 dram to a pint of water.

Fasten the rubber cape with the towel over it around the patient's neck. In irrigating the nose have the patient bend forward slightly from the hips and keep the chin in a horizontal plane. This position keeps the solution from passing to the throat, through the Eustachian tubes to the middle ears, or into the sinuses, and causing additional infections. Start the flow, to expel the air, then introduce the douche tip to follow the course of the septum, and direct it upward slightly. Wash one nostril and then the other until the solution returns clear.

FOREIGN BODIES IN THE NOSE

Foreign bodies in the nose, like those in the ear, are introduced through playful intent by a child. Relief may be obtained by having the patient close his mouth, and with his finger pressed against the unaffected side of his nose, forcibly blow with the other.

Attempts at removal by instrumentation should be undertaken only by one with special training.

THROAT IRRIGATIONS

Purpose

For the application of heat in pharyngitis and tonsillitis.

Equipment

irrigating stand
irrigating can, to which is attached 5 feet of rubber tubing and metal clamp
throat irrigating tip, similar to ear irrigating tip, protected with 2 inches of fine tubing
basin
rubber cape
dressing towel
bath thermometer
measuring glass
1–2 quarts sterile solution

Procedure

Prepare 1–2 quarts of the solution ordered, most frequently normal salt solution at a temperature of 110°–112° F.

Fasten the cape with the towel over it around the patient's neck. Have the head well over the basin so that the patient will not swallow any of the solution, and to prevent it going up the Eustachian tube. Move the tip from side to side up and down so that as much of the pharynx as possible is irrigated.

TRACHEOTOMY

Purpose

Tracheotomy is done to relieve difficult breathing, usually because of an obstruction in the larynx. Difficult breathing may be caused by a neoplasm such as

papilloma, or a malignant growth, lues, paralysis of the vocal cords, laryngeal diphtheria, foreign bodies, etc.

Foreign bodies are sometimes removed from the lungs through the tracheotomy incision.

Equipment

scalpel
straight scissors
smooth forceps
tooth forceps
2-fork retractors
tracheal hook
dilator
3 hemostats
tubes of various sizes
silkworm gut
plain catgut, No. 1 or No. 2
sterile towels
sheets
sponges
linen tape
Mosher dressing

Local preparation

For the local preparation, scrub the area with green soap, bichloride of mercury solution, 1–1000, or a 3% solution of iodine and alcohol may be used. If the patient is a man the local region is shaved. No dress-

ing is applied, as the local scrubbing is done in the operating room.

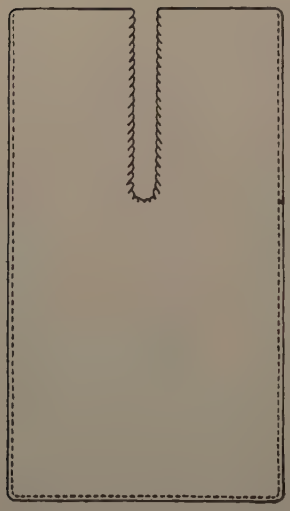
Procedure

During the operation the patient, whether an adult or a child, is usually in a reclining position. The head may be raised from 6 to 10 inches if the patient has difficulty in breathing. A rolled blanket, sandbag, or small pillow should be placed under the cervical spine to make the trachea more prominent. If the operation is an emergency one, no anæsthetic is given. If not an emergency, and if the patient is 12–14 years or more, it may be done under a local anæsthetic. For this purpose a solution of novocaine, ½–1%, is injected in the tissue around the trachea. In some cases ether may be given.

The incision is made either just above or just below the isthmus of the thyroid. The high type of operation is usually considered better unless the patient is to have a complete laryngectomy, then the low type is done.

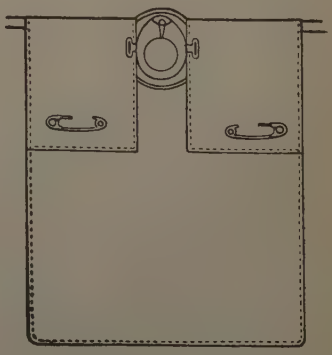
A small vertical incision is made in the skin and any bleeding stopped before the trachea is opened with a vertical incision. The patient should be warned that he will probably cough as soon as it is opened.[1] If the operation is an emergency, the tube, which is usually of silver, is slipped in, tied on, and a dressing put on. When the tube is slipped in, care should be taken not to strike the posterior wall of the trachea, as a violent attack of coughing will result. To hold the tube in

[1] If the patient is instructed to keep the mouth shut when the trachea is opened the coughing spasm will be very much reduced.



MOSHER DRESSING, UNFOLDED

place, a piece of tape about 40–45 inches long is passed around the patient's neck, slipped through the openings in the outer part of the tube, and then tied in back of the neck. Sometimes the two thicknesses of tape around the neck are uncomfortable. Then 2 pieces, each one about 12 inches long, are used. One end of each one is knotted. The free ends are slipped through the slits in the tube and then tied back of the neck.



DRESSING IN POSITION

To protect the incision, the Mosher dressing is used with very good results. This, when finished, has 4 to 6 thicknesses of gauze, and is about 5 by 7 inches, with a slit about 2 to 3 inches long through the middle of one end. The important part of the dressing is to have no raw edges. All the edges are turned in and are sewed, to make sure no threads of gauze may ravel off. The slit ends of the dressing are slipped up under the tape which holds the tube in place, brought down

over the tape, and fastened to the lower part of the dressing with small safety pins. Boric ointment is spread on the skin under the dressing before applying.

If the operation is not an emergency, a window is cut in the trachea. A small-sized ring punch may be used to bite a piece of cartilage from the trachea; first on one side of the incision and then on the other. The danger of this is that the pieces of cartilage may fly from the punch into the trachea and be inhaled into the lungs. Instead of using a punch, the cartilage may be grasped with forceps and excised with a knife. When this is done the tube is not put in for 4 or 5 days. This allows the patient to become accustomed to breathing through the opening without having the possible irritation of the tube at first. The initial incision is made short enough so that no sutures are used after the operation. When a tube is not used the dressing is fastened on the neck with a long strip of adhesive.

For an emergency operation a penknife might be used, and if no other instruments were near, the blunt end of a large bone hairpin might be inserted to hold the incision open.

After care

After the operation the patient should lie on his stomach with a pillow under his chest for about 12 hours. This allows the mucus to drain from the trachea and not be inhaled. At the expiration of the 12 hours the patient may have a headrest for comfort. A nurse should stay with the patient for the first 24 hours at least.

Care of the tube

The inner tube should always be taken out from the outer tube to be cleaned, so that the mucus will not be pushed back into the trachea. If the tube sticks, forceps may be used to pry it loose. The outer tube is never removed by the nurse, as it may be extremely difficult to replace.

The inner tube should be cleaned as often as necessary with boric acid solution, using either pipestem cleaners or feathers. Strips of gauze moistened with boric acid solution may be pushed through the tube with forceps if nothing else may be had. It may be necessary to clean the tube as often as every fifteen minutes to ½ hour the first few days after the operation. As the secretion gradually decreases, the tube will not need to be cleaned so often. Small pieces of gauze may be used to wipe away the secretion from the mouth of the tube. Care must always be taken that no threads of the gauze are inhaled. The dressing over the wounds should be changed as often as it becomes soiled. This will help to prevent an infection of the incision. Boric ointment around the incision helps to prevent infection and any irritation of the wound.

The room where the patient is should be about 80° F., and the air should be kept somewhat moist. If the patient is having great difficulty in breathing, a croup tent and kettle may be used. Care should be taken that the patient is not in a draft. The temperature, pulse, and color should be carefully watched.

Frequently the tube is removed for a short time before it is removed permanently. Then instruments to

dilate the opening should be ready in case the patient cannot breathe without the tube.

Sometimes the tube may be left in the trachea for a few days or weeks, or it may be left in permanently, according to the cause for the operation. If the patient wears the tube constantly, a handkerchief may be knotted around the neck to cover the tube, or some other light dressing may be used. This helps to keep the patient from being so conspicuous on account of the tube, and the sight of it might upset some people. It also helps to strain the air before it enters the trachea.

Occasionally, when the patient is about ready to do without a tube, a cork may be shaved down enough so that it only partially obstructs the tube. It is pushed firmly into place so that the patient cannot blow it out. This is left in for a short time the first day if the patient can breathe with it. The next day a cork, which obstructs the opening a little more, is used. The size of the cork is gradually increased until the opening is entirely obstructed. This gradual closing of the tube assures the patient that he can breathe normally when the tube is removed.

Dangers associated with tracheotomy

The patient may develop bronchopneumonia. If the wound becomes infected, pus may be inhaled and cause a septic pneumonia. If the scalpel nicks the posterior or lateral wall of the trachea an emphysema of the thorax may develop.

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